

Amateur Radio

December 1996

Volume 64 No 12



Journal of the Wireless Institute of Australia



Full of the latest amateur radio news, information and technical articles including...

- **Yaesu FT-3000 – A Paul VK3DIP Review**
- **Maidenhead Locator Program – John VK3KWA**
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Cover

The impressive antenna farm of PA3EPN. The two element beam in the foreground is a full size 80 m Yagi, 36 metres high. Wouldn't it be nice if Santa left an antenna farm like this in our Xmas stocking (complete with planning permits, of course).

BACK ISSUES

Available, only until stocks are exhausted, at \$4.00 each (including postage within Australia) to members.

PHOTOSTAT COPIES

When back issues are no longer available, photocopies of articles are available to members at \$2.50 each (plus \$2.00 for each additional issue in which the article appears).

The opinions expressed in this publication do not necessarily reflect the official view of the WIA, and the WIA cannot be held responsible for incorrect information published.

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A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

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Editor's Comment

Problems and Possibilities

Frequently members ring the Federal Office, or write a letter of complaint, because of the apparent late arrival of *Amateur Radio*. Quite often there is no cause for alarm. The magazine is on time, but different times are normal each month!

The reason is that the date of publication is the **last Friday of the preceding month**. This has the very useful result that each stage in the production process occurs on the same day of the relevant week. This simplifies the whole procedure, particularly for the typesetters and printers, so they can give us a useful discount, thus saving you money!

But there is a disadvantage. The last Friday of the month could be as early as the 22nd (for some Februarys) and as late as the 31st, so there is a span of nine days possible between the earliest and the latest publishing dates. *Amateur Radio* can be nine days later in some months than it is in others, and yet **it's still on time**.

Postal transit time can introduce several more days delay, so we recommend that you wait until the 15th of the publication month before concluding your *Amateur Radio* is lost.

To change the subject completely, from time to time we have wondered where all the people are, mostly young, who could become amateurs, but just don't! What are they doing instead?

Many are probably using the Internet to give another kind of world-wide interpersonal contact which once was possible only by amateur radio. Now we find there is at least one way of linking these similar but different systems. Will McGhie VK6UU gives us the details in his *Repeater Link* column this month. It makes fascinating reading. Look for **Internet Repeaters** about half-way through Will's column.

Since this is the December issue, may I, on behalf of the Publications Committee and all those who help produce *Amateur Radio*, wish you all a Merry Christmas and a Happy New Year.

Bill Rice VK3ABP
Editor

CONTRIBUTIONS TO AMATEUR RADIO

Amateur Radio is a forum for WIA members' amateur radio technical experiments, experiences, opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for possible publication. Articles on computer disk are especially welcome. The WIA cannot assume responsibility for loss or damage to any material. "*How to Write for Amateur Radio*" was published in the August 1992 issue of *Amateur Radio*. A photocopy is available on receipt of a stamped, self addressed envelope.

■ WIA News

Roger Harrison VK2ZRH, Federal Media Liaison Officer

Spectrum Tax Rises But Licence Fees Fall

New amateur licence fees apply from 11 November 1996, with the Spectrum Access Tax and Spectrum Maintenance Component rising slightly, but the Administrative Charge falling so that licence fees are now \$50. Five-year licences will now cost less, falling to \$170 from \$211.

The Spectrum Management Agency (SMA) issued a general circular on revisions to Apparatus Licence fees and charges in late October, advising that the revisions would apply from 11 November. As this did not spell out specific details, the WIA asked the SMA for the changes relating to Amateur Licence fees. The SMA said that the Spectrum Access Tax and Spectrum Maintenance Component, which previously represented \$13 of the licence fee, would rise slightly to \$13.54, while the Administrative Charge would fall from \$38 to \$36. The \$49.54 total has been rounded up to \$50 under SMA policy to round up amounts over 50 cents and round down amounts below 50 cents, where the charge is not a whole dollar amount.

The lower charge for five-year licences results from discounting four lots of the Administrative Charge for renewal, which is now \$20, up from \$11 previously. The discount is now \$80, where it was \$44 previously. So the fee for a five-year licence works out like this: Five years' fees at \$50 per year is \$250, less \$80 (four lots of \$20) comes to \$170.

For amateur beacons and repeaters, it's a different story. There is good news for those wanting to license new beacons and repeaters, or change frequencies, but bad news for everyone who wants to keep them running. The fee to issue new licences for beacons and repeaters is now a flat \$50 per frequency, in the case of beacons, or frequency pair in the case of repeaters (link frequencies being excluded). The previous renewal fee of \$24 per frequency or frequency pair is now \$50. Gone is the frequency assignment fee for new beacon or

repeater licences, which was a minimum of half an hour at the SMA's hourly rate of \$91 per hour.

Full details are available in the revised *Apparatus Licence Fee Schedule*, publication RIB 68A, available from the Spectrum Management Agency.

The October circular from the SMA foreshadowed a number of areas where charges were to be varied. These included a Consumer Price Index (CPI) rise of 2.7% since 1994, the need to fully recover costs associated with Australia's membership of the International Telecommunications Union, funding from licence fees from a government decision

to set up a research and public information program on health issues associated with electromagnetic radiation (see separate WIA News item), and a review of actual costs involved in issuing and renewing licences.

The SMA said that overall revenue from licence fees and charges was estimated to increase by approximately 3.4% in 1996/97, with individual licence fees varying depending upon the particular type of service.

The SMA and a working group from the Radiocommunications Consultative Council (RCC) earlier this year completed a post-implementation review of Apparatus Licence fees under the new fee structure. (See WIA News, page 20, August issue). Separately, this year the SMA reviewed their charges, including those for issuing and renewing licences. The SMA said they had also moved to standard charging for licence issue wherever possible, to provide licensees with greater certainty when applying for new licences.

Impact on Some Services

The WIA is concerned that the more-than-doubling of the beacon and repeater renewal fee puts an unreasonable impost on those Institute divisions, WICEN groups and local clubs who have established and maintain these facilities as a service to the amateur radio community. The recurrent cost of licence fee renewals will be beyond the resources of many as a result of this revision in amateur beacon and repeater licence fees, and there is concern that a number of services will likely cease to operate.

The WIA is aware that the high cost of obtaining new repeater and beacon licences since the SMA's new Apparatus Licence Fee regime was instituted in April 1995 has led to the abandonment of a number of experimental systems and services. Previously, the fees for issuing a new beacon or repeater licence, or varying the frequencies involved, attracted a frequency assignment fee in addition to the \$24 licence fee for each transmitter frequency.

The frequency assignment fee was a minimum of half an hour at the SMA's hourly rate of \$91 per hour. However, quotes amounting to hundreds of dollars to issue a repeater licence were reported

to the WIA by a number of clubs and groups. The WIA was recently quoted an amount of \$520 to issue a licence for the proposed five-band International Beacon Project HF beacon for Perth. That was \$104 per frequency, one licence per frequency, although only a single call sign is needed. The SMA's Perth Area Office quote listed a cost of \$91 to issue and assign each licence, plus \$13 in "spectrum charges".

While the removal of the time-based assignment fee for new beacons and repeaters from 11 November is welcome relief in that it lowers the cost and provides certainty, the WIA has previously indicated to the SMA that renewal charges on a per-frequency or frequency-pair basis placed an inordinate cost burden on established sites which carried multiple services. The rise from \$24 to \$50 now makes matters much worse.

The WIA has already raised with the SMA the issue of having beacon and repeater licence fee renewals charged on a per-site basis, rather than the present per-frequency basis, particularly where one call sign is used by all or a number of transmitters. The WIA will continue to pursue this issue vigorously.

IARU News

David Wardlaw VK3ADW

World Radio Conference Strategies Decided

Meeting in Tel Aviv, Israel, in early October following the Region 1 Conference, the Administrative Council of the International Amateur Radio Union (IARU) considered issues relating to the 1997 World Radiocommunications Conference of the International Telecommunications Union, WRC-97 and the 1999 Conference, WRC-99.

The IARU delegation attending WRC-97 has been announced as a result. The delegation will consist of IARU Vice President, Michael Owen VK3KI; Region 1 Vice Chairman Wojciech Nietyksza SP5FM; and IARU Secretary, Larry Price W4RA, who is also the American Radio Relay League (ARRL) International Affairs Vice President. The IARU Administrative Council agreed at the Tel Aviv meeting on instructions to be given to the delegation.

As allocations relating to the 7 MHz band may be on the agenda of the WRC-99 ITU Conference, the Administrative Council discussed a comprehensive report from the 7 MHz Strategy Committee and updated the strategies guiding IARU preparations for 1999. As the approved action plan is being distributed to IARU member societies, the WIA will publish details in due course.

In addition, the Administrative Council received the recent report from the Future of the Amateur Service Committee (FASC). (See *IARU News*, page 4, October issue). The FASC is preparing a further paper on the subject of possible revisions to Article S25 of the International Radio Regulations, which defines the Amateur Radio Service, anticipated to be considered at WRC-99.

Anticipated future requirements for radio spectrum allocations to the Amateur and Amateur Satellite

Services were reviewed and updated by the Administrative Council. This covered the low frequency range, the 7 MHz band, the lower VHF range and microwave allocations.

An extensive report on the utility of beacon stations in the Amateur Service was received from an ad hoc committee, and their recommendations adopted.

The council reappointed for new terms the team of international coordinators and advisers who report to them on specialised areas of interest. They are:

• EMC Adviser: Christian M. Verholt OZ8CY;

- International Beacon Project: John G. Troster W6ISQ;
- Monitoring System (Intruder Watch): Robert E. Knowles ZL1BAD; and
- Satellite Adviser: Hans van de Groenendaal ZS5AKV.

In other decisions taken at Tel Aviv, the Advisory Council is to appoint a public relations committee to publicise the work of the IARU, and the theme for **World Amateur Radio Day**, 20 September 1997, will be "35 Years of Amateur Radio in Space."

At the IARU Region 1 Conference preceding the Administrative Council meeting (see *IARU News*, page 4, November issue), Region 1 decided to move the six metre SSB "centre of activity" to 50.150 MHz, considered frequencies on 144 MHz for use by Shuttle Amateur Radio Experiments (SAREX) and the future International Space Station (ISS), and initiated a project to obtain a new common low frequency band allocation.

IARU identity SK

IARU President-Emeritus, Noel Eaton VE3CJ, died at his home on Ontario, Canada, on 28 September. He was 86.

Eaton served as IARU President from 1974 to 1982, and was inducted into the Canadian Amateur Radio Hall of Fame in 1993. He built his first receiver in 1922 and gained his amateur licence in 1937.

Before gaining the seat of IARU President, he served as Treasurer of the IARU Region 2 Association for the decade before 1974. He also held a number of positions on Canadian amateur groups and with the American Radio Relay League. As IARU President, Eaton attended many ITU and other international conferences, and visited national member societies of the IARU in 48 countries. He was presented with numerous awards and honorary memberships from amateur societies and organisations throughout the world.

With a BSc in Textile Technology

from the University of Manchester in England, he worked in the Canadian textile industry, retiring in 1959 from the Eaton Knitting Company of Hamilton, Ontario, as President and General Manager. During World War 2, Eaton served in the Royal Canadian Air Force, retiring in 1945 as Chief Signals Officer HQ, No 6 Group RCAF, with the rank of Wing Commander.

IARU Region 2 President, Tom Atkins VE3CDM, honoured Eaton as "a highly respected and widely known personality in the international amateur radio community." The Editor of *The Canadian Amateur*, Rob Ludlow VE3YE, said he was "probably the greatest ambassador for Amateur Radio in the world. He worked tirelessly for the betterment of radio amateurs everywhere."

[Details courtesy of the ARRL's *The ARRL Letter* and the Web sites of the Radio Amateurs of Canada and the Radio Society of Great Britain].

Government Launches Study Into Electromagnetic Energy Health Hazards

Public concern over possible adverse health effects arising from long-term exposure to radiofrequency electromagnetic energy spurred the government into announcing in October plans for a five-year study costing \$4.5 million to be managed by the National Health and Medical Research Council.

The announcement was made in a joint release by the Minister for Communications and the Arts, Senator Richard Alston, and the Minister for Health and Family Services, Dr Michael Wooldridge.

To be known as the radiofrequency electromagnetic energy (EME) program, the decision to launch the study was sparked by an AGB McNair public survey of more than 750 people which found there was strong support for more information on the issue to be made available from the government and for further research into EME health issues.

The \$4.5 million cost of the study will be funded by about a 1% increase in radiocommunications licence fees, commencing from 11 November.

Senator Alston said: *"Sections of the public are concerned about possible adverse health effects from long-term exposure to RF EME, especially in regard to children, with the increased use of radio-based communications technologies, such as mobile phones."*

The AGB McNair survey also revealed that other health issues, such as skin damage from sun exposure, breast cancer and death or injury from road accidents, were of greater concern.

Dr Wooldridge said while there is no substantiated evidence available to date of adverse health effects associated with RF EME exposure, within the standards that apply in Australia and overseas,

there is still a need for further research and to provide more information to the public.

"An important part of this project will be the provision of factual information about the use of mobile phones and about exposure levels," Dr Wooldridge said.

"A committee of health, scientific and communications officials has already been established to examine and advise the government on RF EME-related matters, including national and international research findings and the potential for further research."

"The RF EME risk management and communications program is concerned with implementing practical measures to address RF EME public health issues," Senator Alston said.

The program involves: the establishment of an Australian research program to examine RF EME issues of particular relevance to the Australian environment, to complement overseas research activities; public dissemination of contemporary information about RF EME public health issues; and continuing participation in the World Health Organisation's project to assess the health and environmental effects of EME exposure.

Standards Australia has a published standard on RF (non-ionising radiation) exposure levels, AS 2771, and for some years has had a joint Australian-New Zealand standing committee studying the subject. The WIA is represented on this committee.

Some reportedly reputable statistical studies have been used to link the incidence of cancers in the community and the location of power lines and transmitters. Television "grabs" of a

variety of "experts" from the pro and anti sides leave a disquieting impression. The scientific community has been variously charged with ignoring "the problem" to conspiring to generate a whitewash.

There is understandable suspicion of scientific reports which contradict one another over assertions that electromagnetic radiation from power lines, cellphones and the like are a hazard to health. In the past, various vested interests and public authorities have failed to give adequate warning of the hazards of asbestos, insecticides, radioactivity and nicotine, for example, despite the hazards being well understood for many years.

Public concern over health hazards from radio transmitters is not well founded. Research on the biological effects of electromagnetic waves goes back a few decades. One of the most authoritative sources which reviews the scientific and technical work up to 1993 was produced by the World Health Organisation (WHO), titled *Environmental Health Criteria 137, Electromagnetic Fields (300 Hz to 300 GHz)*.

Controversial studies on cells prepared from chickens' brain tissue have shown that calcium ions are released above a certain level of RF radiation, which is well below that attributed to heating. But it only occurs when a special "modulated" signal is used. Exchange of calcium ions between cells is important in biological processes, but there is no evidence that the observed effects are relevant outside the isolated cells studied. The WHO study makes the cautious conclusion that the reported effects cannot be seen as a potential health hazard as there is little or no evidence that it occurs in animals or humans.

Studies on humans have necessarily had to look at populations of people exposed to radiofrequency radiation, looking for health effects (death rates, cancer rates), compared against a "control" population. One such looked at 40,000 US Navy people for 20 years after two-years-on-the-job exposure to radars.

One of Australia's foremost researchers in the field, Australian

Radiation Laboratory chemist, Dr Colin Roy, said in Perth recently that while general scientific opinion was that the risk from mobile phones was very low, more research should be done. He said that the best study to date had found no difference between laboratory animals exposed for a lifetime compared with those that hadn't. The problem was, he said, that no study could prove there was positively no risk. However, there are other Australian researchers who differ on the likelihood of health hazards from electromagnetic radiation.

A European Commission (EC) study by a special expert group to initiate research into possible health effects related to mobile telephony reported in September that there is no evidence that a health threat exists for millions of mobile phone users. The expert group chairman, Alastair McKinlay, said: *"The group is quite clear that there is no existing scientific evidence of a cancer risk."*

The group has identified, however, that gaps do exist in knowledge of this area. The explosion in use of mobile phones was quite recent, McKinlay said, and that such research makes sense to quell any public concern.

The Australian Mobile Telecommunications Association (AMTA) endorsed the government's announcement, saying that more public information would help counteract alarmist tactics which promoted adverse health effects related to mobile phones and cellular base towers.

AMTA executive director, Alex Gosman, said: *"These claims have not been based on any substantiated evidence and the government's action will allow the separation of health and environmental issues which are often confused in public discussion."*

The RF EME program in Australia will be coordinated jointly by the Communications and the Arts and Health and Family Services portfolios through the Committee on EME Public Health issues. Program functions will be contracted out to appropriately qualified government and non-government bodies, such as the CSIRO, universities and hospitals.

Federal Council Plans for 1997 and Beyond

Plans affecting the Federal WIA's operations and activities from 1997 through the year 2000 were high on the agenda during discussions at the meeting of the Federal Council, held over the weekend of 26-27 October.

It was the Council's third, and last, meeting for 1996.

Among a series of major resolutions concerning the future operation of the Federal WIA were: that there would be a budget surplus in 1997; a decision to return to a common membership renewal date; that the production, printing and posting of *Amateur Radio* magazine would be "outsourced"; that Examinations would be held eight times a year, each on the same day nationwide; decisions on preliminary planning for WIA representation to the ITU conferences WRC-97 and WRC-99, and the International Amateur Radio Union Region 3 Conferences in 1997 and 2000.

The 1997 budget for the operations of the Federal WIA and the Federal Secretariat was a key agenda item, with the Federal Council deciding that the Federal Directors should run the operations to produce a small surplus in 1997, after a loss in 1995 and another loss forecast for 1996. Some restructuring of WIA operations will be necessary to achieve this, but the Federal Council determined that essential services should not suffer.

Membership renewals will return to a common date from 1997, which will be 1 July. The Federal Directors anticipate that this will reduce the cost/member of maintaining the centralised, Division membership database.

Queensland Division members are unaffected by this change as the Division manages its own membership database operations. Members whose renewals fall due in January will receive a renewal notice for six months' membership, followed by another renewal in June for the next 12 months' membership. New members joining throughout the year will pay a pro-rata

membership up to the common renewal date of 1 July.

Following a decision made at the annual general meeting in May, directing the Federal Executive to seek expressions of interest to tender for the production, printing and mailing of *Amateur Radio* magazine as a single "outsourced" operation, the directors tabled responses for the Federal Council's consideration. The current production contract expires in December. The Council moved that the directors select a suitable contractor, in the meantime securing continuity of production if necessary until a contract commenced.

This does not mean that *Amateur Radio* magazine is being "sold off" to a private publisher. The magazine remains the property of the WIA. It simply means that one firm will be responsible for doing the physical work necessary so that material presented for publication each month by the Editor and Publications Committee is assembled for printing, and that it is then printed and posted by the due date each month. It is anticipated that there will be some worthwhile cost savings to the Institute from this change to outsourcing *Amateur Radio* magazine's production in this way, compared with the existing operation.

In a move to maintain the general cost of providing amateur examinations at present levels, the Federal Council decided that examinations would be held on eight fixed dates throughout the year, applicable Australia-wide. This was in response to a situation which had developed where the number of individual or small examination events had reached a proportion where the costs of running the WIA Exam Service had become too high to continue in the same way. From 1997, single-event examinations will attract an "event fee" of \$50. Exam Service invigilators are being advised of the changes. Dates for the eight examination days are to be decided.

Changes to High Power Operations

Permission to use transmitter output power levels above the authorised maximums of 400 W for SSB and 120 W for CW were previously granted by a letter of authority to successful applications from individual amateurs. The SMA has changed this procedure since the introduction of the new Technical Licence Specifications (TLSs).

Now, amateurs seeking to conduct experiments using transmitter power levels above those specified in the TLSs have to apply for a separate Scientific Assigned Licence, according to information supplied recently by the SMA. This also applies where amateurs wish to operate on frequencies outside those specified in the TLSs. Generally, amateurs have sought high power permits for moonbounce work, and some individuals have sought permits to

transmit in the low frequency (LF) range, below 200 kHz. Amateurs experimenting on LF were previously licensed under the Experimental licence type, which disappeared with the new Apparatus Licence regime introduced in 1995.

However, the SMA advises that high power operation will not be granted for experiments in the 50.0-50.3 MHz Eastern States "DX Window" segment of 6 m. Following a recent application from a Victorian amateur seeking approval to use 1 kW in the 50.0 - 50.105 MHz segment for moonbounce experiments, the SMA has advised the WIA that, because the band 45-52 MHz is designated primarily for broadcasting purposes and the Radiocommunications Act prohibits the SMA from issuing licences in this band without consent

from the Australian Broadcasting Authority (ABA), they sought approval from the ABA. The ABA said that operation could not be approved in this band in the Eastern States of Australia, under any type of licence, for a power higher than that authorised under the Amateur TLSs owing to the high likelihood of interference to Channel 0 reception.

While Channel 0 continues to be used, the SMA is unable to approve high power operation in the 50.0 - 50.3 MHz band segment in New South Wales, Victoria, Queensland, Tasmania, the ACT and the Jervis Bay Territory. The present transmitter output power limits for this band segment in these areas are 100 W (pY) for CW, 100 W (pX) for SSB and 30 W (pY) for FSK (narrowband digital signals).

International Obligations

A World Radiocommunications Conference is being organised by the International Telecommunications Union (ITU), WRC-97, to be held late next year in Geneva, Switzerland. As a number of issues affecting the Amateur Radio Service will surface at this conference, the Federal Council decided that the Federal Coordinator responsible for this area, David Wardlaw VK3ADW, is to attend. The anticipated \$10,000 cost will be funded from existing reserves created for the purpose from the \$2 International Levy component of each membership fee. David foreshadowed that two delegates would really be needed at the next conference, WRC-99, at which Article S25, which defines the Amateur Service, is scheduled to be on the agenda for discussion.

The Federal Council considered the delegation to be sent to the International Amateur Radio Union (IARU) Region 3 meeting to be held in Beijing, China, in

September next year. It was agreed that the IARU Liaison Officer, David Wardlaw VK3ADW, must attend along with three additional WIA representatives. Planning for agenda items and discussion papers to be proposed by the WIA for the Beijing conference is under way. This conference will consider the region's view on the issues raised by the IARU Future of the Amateur Service Committee's discussion paper and first report, circulated during this year. The following Region 3 conference will be held in Australia in the year 2000, planned to be immediately after the Sydney Olympics. It will be held in Queensland. The Queensland Division is investigating preliminary planning and logistics.

In addition to the above, the WIA Federal Council laid plans for three meetings next year. The annual general meeting is mandatory under the

Corporations Law, and this will be held in May. The other meetings, or Extraordinary Conventions, will be held in early February and late September. Ways and means of reducing convention costs are being looked into.

A new Federal Coordinator position was created, that of **WIA Federal Radio Sports Coordinator**. Wally Watkins VK4DO was appointed to the new position. Wally organised and vigorously promoted the 2nd Region 3 Amateur Radio Direction Finding (ARDF) Championships held in Townsville during July. (See *Amateur Radio*, page 7, September issue). Wally's brief is to initiate, coordinate and promote radio sports activities within Australia and internationally.

Further news of WIA Federal Council decisions from the October Extraordinary Convention will be in *WIA News* in the January 1997 issue.

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■ Equipment Review

Yaesu FT-3000M

Reviewed by Paul McMahon VK3DIP*



The Yaesu FT-3000M. Comparison with the microphone shows the compactness of this high power rig.

What is it?

The FT-3000M is what some call a one-and-a-half-band box. It is basically a 2 metre FM mobile transceiver with a separate wideband receiver. It has up to 70 watts of transmit output power on 2 m, with receiver coverage of 110 – 180 MHz, 300 to 520 MHz, 800 to 869 MHz, and 894 to 999 MHz. The chunk missing in the later range is basically the mobile phone band. The unit is of mid size (140 x 40 x 180 mm, not counting the big, sticking-out knob) and is perhaps a little heavier than normal with a weight of 1.25 kg. The review unit was kindly supplied by Dick Smith Electronics and had the serial number 5N010231. Retail Price is \$799.

First Impressions

Someone at Yaesu is getting adventurous; this box was obviously designed to at least look different. Instead of having the controls and buttons spread evenly over the front panel, most of the knobs and buttons live

in an area on the right of the panel. This control cluster is obviously designed to be able to be operated with one hand with the minimum of finger travel. Some ergonomist has given these controls a lot of thought, and once you had had a bit of practice you could probably do just about any function by feel, and very quickly. I must admit, though, it does look a bit strange to have this mountain of controls sticking out of the box. Yaesu calls them dual concentric multi-purpose selector knobs and associated control buttons.

This sort of design could well be very good for some hams who have problems with the more normal arrangements of controls. It would be interesting to know if Yaesu had this market in mind when it was designed. Apart from this control cluster, the rest of the front panel contains only two knobs, one for volume and one for squelch, and a large multi-function display panel.

This display shows the frequencies of the main and sub-band simultaneously,

along with a multitude of other things such as the prompts for the menu system, and even the supply volts if required. The latter could be very useful in this case, as the set draws a hefty 15 amps continuous on high power transmit which will make wiring in the car and the condition of the car battery very important.

The box also offers the little brother of the Spectra-Analyser feature I reviewed last month in the Yaesu FT-8500. In this case it is called a Spectra-Scope, with the main difference being that, instead of a true graphical display, activity either side of the centre frequency is indicated via a clever arrangement of standard character segments.

Audio quality seems good in subjective on-air tests, and the receiver sensitivity seems uniform across the ranges covered. The noise from the dual fans was not as loud as expected, though again the increased airflow needs may complicate mobile installation.

Again similar to the recently reviewed FT-8500, the manual actually seemed to cover all the features of the set, and yes, there is a reasonably detailed circuit diagram. I hope this is now a Yaesu standard which will be adopted by others. Also in the standard styrofoam and cardboard box was a mobile mounting bracket, power cable, spare fuse, and miscellaneous nuts and bolts for the bracket.

Technical Bits

The receiver frequency coverage of the set is as mentioned above, 110 – 180 MHz, 300 to 520 MHz, 800 to 869 MHz, and 894 to 999 MHz. The segment 110 – 137 MHz can be set up for AM or FM via a menu option. The transmit coverage is 144 – 148 MHz.

The specifications describe the set as a double conversion superhet with a 45.05 MHz first IF and a 455 kHz second IF. Sensitivity for 12 dB SINAD is claimed as less than 0.2 μ V for the main 2 m band but only less than 0.25 μ V everywhere else. Selectivity is on a par with other like boxes, as is spurious and image rejection. Rated audio output is 2 watts and, subjectively, sounded clear and clean. For the transmitter the rated power outputs were 75, 50, 25, and 10 watts. Peak current drain at the



Rear view of the FT-3000M showing the efficient twin cooling fans.

various power outputs is given as 15, 10, 7, and 5 amps at 13.8 volts.

The set has 70 normal general purpose memories arranged as seven banks of ten. As well, there are eleven special purpose memories including a home, a priority, and scan edge memories. Each memory can store either separate receive/transmit frequencies or repeater offset, and can also store an up to five alpha/numeric name which can be displayed instead of the frequency. Tuning step sizes of 5, 10, 12.5, 15, 20, 25, or 50 kHz are available in all segments except 800 - 999 MHz where some of the smaller steps are not available.

The set also has a function that I must admit caused me to laugh when I first read of it in the manual. The ARTS, or Auto Range Transpond System, can automatically poll other similarly equipped sets to see if they are in or out of range with appropriate indication on the front panel and melody sound effects. The tones are ascending for in-range and descending for out-of-range indication. It just shows you that memory space in the control processors must be cheap and that people are scratching for ideas, or alternatively there is some real reason why someone would want this function that just totally escapes me.

The set also has the usual complement of scanning options and pager and message systems available with an optional module. It is possible to page the set and leave either one 16 second voice message or two 8 second messages (configurable via the menus).

Also, as is becoming standard, the set has a connector at the rear for packet operation (1200 and 9600 baud).

Other features include DTMF remote control, and transceiver cloning where the setup of one transceiver can be loaded into another. These latter two features should imply that the set could be computer controlled in a similar manner to the FT-8500, but no mention of this possibility is made in the handbook. However, a check with Dick Smith Electronics discovered that Yaesu produce a software/interface package, called the ADMS-1B, which is available for use with both the FT-8500 and the FT-3000M.

The bit I enjoy most about doing these reviews is the chance to, at least when provided, study the circuit and block diagrams to see how the sets tick. Over time we have gone through an evolutionary period where initially the bulk of the innards were taken up with the RF side with all discrete circuits just about out of the same basic text book. We then went through a period where this shrank away into a couple of ICs and the control electronics began to predominate. Now this too has begun to shrink in the number of ICs, if not in power, and we are seeing some real variation and inventiveness in the RF side again. In many cases the designers are doing things that just would not have been practical before the advent of high powered control microprocessors.

In particular, I have noticed what appear to be hybrids of narrow range receivers and circuits that would seem more at home in a scanner. The set

construction technique seems to reflect this hybrid, too, with the ham bits usually being on the mother boards and the scanner bits being separate small daughter board modules. This set is a good example of this. It has four separate receiver front ends, each optimised for different band portions or uses. Two of these provide separate tracking narrow range front ends for the 2 m and 70 cm bands, the more complex of the two being the 70 cm one which can also double as a wide range UHF front end. The other two front ends provide wide band VHF coverage and the 800 - 999 MHz getting-on-for-SHF range. This sort of thing would have been very unwieldy to manage and control before the micro controller.

The basic receiver operation is pretty straightforward. The appropriate front end is selected by the micro, using simple biased diode switches and fed into a wide band double balanced mixer made using a pair of dual gate mosfets along with the appropriate first local oscillator frequency derived from either

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the VHF or UHF VCO. The output of the mixer is fed via a monolithic crystal filter (45.05 MHz) through an IF amp and into a single IC FM/AM receiver IC, a TK10930V for those interested. The SHF front end is quite interesting, consisting of just two transistors, one an RF amp and the other a mixer. For SHF there is not a special VCO off the PLL; instead, the UHF one is reused twice! For example, at, say 900 MHz, the signal is amplified by the RF amp stage then mixed with the UHF VCO at 427.475 MHz to give 472.525 MHz which is fed into the main mixer and again mixed with the 427.475 MHz UHF VCO to finally give the 45.05 MHz IF.

Effectively, the UHF local oscillator is being doubled, which explains why, for SHF, the small step sizes are not available as they too will be doubled by this process. This same trick should be also possible as an add-on mod for existing UHF receivers both scanning and amateur. The frequency display would, of course, be wrong, but for the cost of two extra transistors and some switching you have SHF coverage.

Operation

I found the smart search feature a useful operating aid. With this you can scan a range between limits set in some special memories, and up to 20 frequencies, where activity was found, will be stored sorted by either frequency or signal strength order (selectable via menu) in a special set of memories. For contesting/scrambling this could prove invaluable, effectively giving you a list of where the other stations are, or have been, which you can quickly step through and exchange a number, etc.

The Spectra-Scope was also not bad, but I felt it was let down by the lack of resolution in the display, at least in comparison with the FT-8500 with its finer detail.

As has been said, the audio quality on transmit and receive was, as is usual these days, well received from on-air reports, etc.

General use of the set was straightforward, though I must admit to finding some things easier to do using the keypad on the microphone rather than the front panel controls. The ability

to user-program the four function keys comes in handy here. As to the dual concentric multi-purpose selector knobs and associated control buttons, I can't say I ever got really used to them, but again I'm sure that for some people they will be just perfect.

One caveat I would make with this rig is that you should watch the current usage on high power. I found it hard to find a power supply that would deliver the 15 amps continuously for any length of time. In most cases in the race to see who got hottest, the rig with its dual fans stayed reasonably cool, but the power supplies got very hot. The standard power supply I use for a normal 200 watt HF box, which is rated at greater than 20 amps peak, was much better at heating up than the rig, and I wouldn't have wanted to use it on high power for,

say, a full day contest. However, Dick Smith Electronics advise that their D-3800 power supply is quite suitable for use with high power transmissions from the FT-3000M.

Likewise, in a mobile/car installation, you will have to watch how long you talk; sucking 15 amps continuously out of your car battery, even with the engine running, will lead to a flat battery, and you can't call for help on 2 m if your new transceiver needs 5 amps, even on the lowest power setting, out of a flat battery.

Conclusion

If you need a high power 2 m box, and/or the unique control arrangement of this rig suits you, and you have a good high current supply, then this rig seems good value at the price.

*47 Park Avenue, Wattle Glen VIC 3096

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WIA News

Cat's Whiskers

Explaining radio communications to non-technical people is now much easier, thanks to the late, world-renowned physicist, Albert Einstein.

According to *The ARRL Letter Electronic Update* for 25 October, when Einstein was asked to describe radio, he is said to have provided this eloquent description: "You see, wire telegraph is a kind of very, very long cat. You pull his tail in New York and his head meows in Los Angeles. Do you understand this?" Einstein then continued: "Radio operates exactly the same way - you send signals here, they receive them there. The only difference is that there is no cat!"

New WIA Members

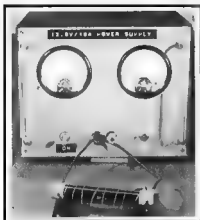
The WIA bids a warm welcome to the following new members who were entered into the WIA Membership Register during the month of October 96.

L21029 MR C J LORD
L30941 MR D SMIDT
L30942 MR R THIEDEKE
L30943 MR R SMITH

L40299 Mr K FULLER
L50351 MR T KEENAN
L60349 MR L BRYSON-HAYNES
L60350 MS S L KEOGH
VK2ATY MR A THUMA
VK2ENT MR N W TURNER
VK3DLE MR L ENRIQUEZ
VK3FGN MR N FERGUSON
VK3FGO MR R BOUWMAN
VK3GRT MR G TAYLOR
VK3KDR MR D PARSLow
VK3UE MR M LE MAISTRE
VK4AJO MR J LEE
VK4BMJ MR J MCQUIRE
VK4BQG MR Q GREENE
VK4FO MR G TIBBITS
VK4GLD MR T SOLLART
VK4KLT MR M MARSHALL
VK4PGD MR P DILLEY
VK4PJK MR J JOHNSTON
VK4SFK MR K STEEL
VK4UGS MR G SMITH
VK4WW MR N WALDEN
VK4YIX MR R AUER
VK4AKI MR R JONES
VK5CCA CONCORDIA COLLEGE
VK6JS MR J G SWINEY
VK6YGC MR M H TELLING

Power Supplies **"Miser's" 13.8 volt** **10 or 20 amp** **Power Supply**

Drew Diamond VK3XU and Ray Dean VK3RD** explain how to build a very useful and relatively cheap power supply.*



Drew Diamond's 10 A PSU delivering 11.5 A.

When it is necessary to operate a 12 V DC device from an AC mains outlet, a DC power supply unit (PSU) is required. Generally, a fully regulated, quiet PSU with a continuous capacity of more than a few amps is a costly item. However, amateurs take pride in being able to make things at minimum material cost, and certainly the construction of a home-made PSU is an ideal project for the resourceful builder. It is over ten years since the late Des Greenham described his popular home-brew power supply [Reference (2)] in *Amateur Radio*. Unfortunately, the UA78MG regulator chip used in that design has become hard to get, so what

follows is offered as a workable, and hopefully improved, pattern using presently obtainable components.

For many of us, the most expensive item would probably be the power transformer, a component costing anything up to \$100 at present. However, as is well known [see References (1), (2) and (3)], a practical solution is to re-wind the secondary of a transformer rescued from a junked TV set. Filter capacitor(s), diodes, heatsinks, meters and other components can be purchased at hamfest sales, bartered with radio friends, or bought new if necessary. More later.

Performance

- Output Voltage:** Nominally 13.8 VDC (ie that of a good car battery, engine running).
- Output Current:** Conservatively 10 A or 20 A at 60% duty cycle.
- Line Regulation:** Less than 10 mV change in output from 230 to 250 VAC mains input voltage.
- Load Regulation:** Less than 10 mV fall in output voltage from no-load to full load.
- Ripple & Noise:** Less than 5 mV p-p at full load.
- Current Limit:** Set at 10 A or 20 A
- Output Protection:** Reverse voltage and over-voltage.

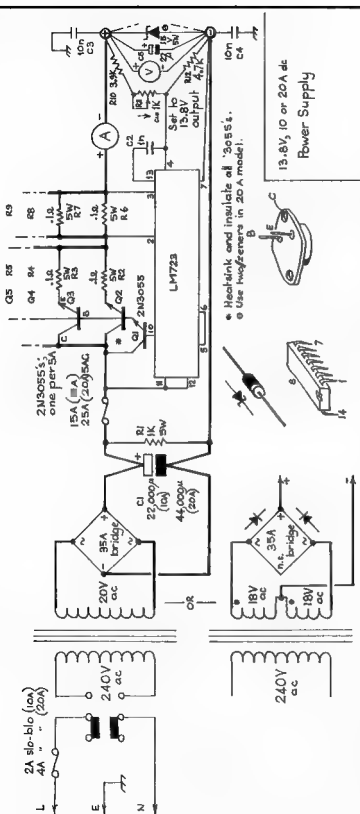
Circuit

The circuit is conventional. The 20 VAC output from the transformer is rectified, and the "raw" DC is applied to filter capacitor C1, which supplies smoothed, but as yet, unregulated DC at about 25 V with no load. C1 has a 1 k bleed resistor R1 connected to discharge C1 when mains power is removed. An LM723 (an oldie but a goodie, and readily available) performs the regulating function.

Output voltage is sampled right at the output terminals, and is injected into the invert input at pin 4. Error signal at pin 10 sources a Darlington connected 2N3055 at Q1, which drives the parallel connected 2N3055 pass transistors Q2—Q3 (and Q4—Q5 in the 20 A version).



Ray Dean's 20 A PSU.



Circuit diagram of the "Wiser's" 13.8 volt 10 or 20 amp power supply.

To force current sharing (up to 5 A each), 0.1 ohm resistors are connected in the emitter lead of each pass transistor.

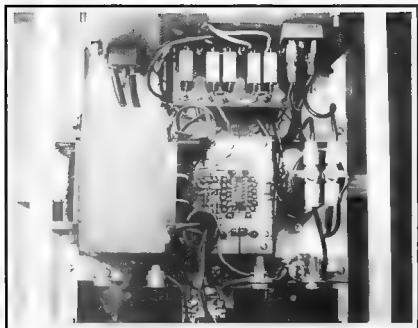
The voltage developed across the sense resistor comprised of two (or four) 0.1 ohm resistors in parallel at R6 - R7 (and R8 - R9) supplies the current limit signal into the '723 at pins 2 and 3. So, as the voltage developed across the effective 0.05 ohm (or 0.025 ohm) approaches 0.6 V, the '723 will cause the supply to go into the constant current mode, automatically limiting in response to any attempted demand beyond about 12 A (25 A).

HF instability is suppressed by inclusion of the 1 nF capacitor C2 between pins 4 and 13. RF is discouraged from entering the supply by inclusion of RF by-pass capacitors C3 and C4 connected from each output terminal to chassis ground. The output "floats" so that positive-earth devices may be powered if necessary.

Reverse voltage and over-voltage protection is provided by the simple trick of connecting one or two 15 volt 5 W "sacrificial" zener diodes at the output terminals (much simpler than crowbar, and not prone to false triggering). Should one of the pass transistors unfortunately fail, and short between collector and emitter, the diode(s) will zener at 15 Volts. The DC fuse will blow, disconnecting DC power and thus protecting the load. The zener(s) will probably be destroyed (tests on numerous diodes, by deliberately shorting one pass transistor always caused a 5 W diode to short), but replacement of this part is nothing compared to the damage which would almost certainly result from the application of perhaps 20 V or more to your valuable transceiver.

Construction

To assist in heat transfer, and improve immunity to external RF fields, a metal case, box or cabinet is to be preferred. Actual size and shape is largely dictated by the major components, the transformer, heatsink and filter capacitor. The 10 A model is housed in a home-made aluminium box measuring 220 x 226 x 170 mm WDh. Front and rear panels are of 3 mm thick material, connected with 220 mm



Internal view of the 10 A PSU.

lengths of 10 mm square section aluminium rod. The 20 A model measures 300 x 250 x 250 mm WDH, using the classic U style aluminium box chassis.

The job of re-winding a suitable transformer has been well covered in references (1), (2) and (3). We would just add the following; wind on two or three more turns than calculated. If there has been some small error, it is easier to remove turns, rather than add, after the lamination stack has been re-assembled and tested. If a choice of "re-windable" transformers exists, use one that is perhaps larger than necessary. The well-known split-bobbin B&W TV types are certainly easy to work with but, in reality, these may not be capable of sustaining a 200 VA load (that's 20 VAC at 10 A effective secondary load for the 10 A model) for very long without overheating.

A workable estimation of the VA rating may be calculated from $VA = (a \times 0.865)^2$, where a is the area of the bobbin window in square cm. For example, say the window measures 4 x 5 cm = 20 sq cm, then $(20 \times 0.865)^2 = 299$ VA. A core of this size should be adequate for a 10 A supply. An extra clue is to measure the DC resistance of the 240 VAC primary winding, a reading

of about 3 to 5 ohms is typical for a 300 VA, and about 7 to 10 ohms for a 170 VA. A 500 VA would suit the 20 A model. By the way, when measuring the primary resistance of a good transformer, note how sluggishly an analogue meter needle moves off zero then creeps towards final reading. When you reverse the leads it is even more sluggish, indicating a large inductance of the primary winding.

If you want to buy new, some of the usual electronics retailers have transformers which should suit the 10 A model. The secondary voltage must be at least 18 VAC, and preferably 20 VAC (but not much higher than 20 V). Because, in normal working, we only transmit for up to half the time, it might be assumed that a 5 A winding will do for a 10 A transmitting load. However, much improved regulation and reliability will be obtained if the transformer is matched to the actual maximum current demand.

The transformer primary must be fused and switched as shown. Use a 2 A or 4 A slo-blo fuse in the line (brown wire) side. All mains connections MUST be adequately insulated or covered to prevent accidental contact, and the mains earth connected to chassis ground with a dedicated (ie not shared

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**BALLARAT CONVENTION
A GREAT FAMILY DAY.**

What a great turnout at the recent Ballarat convention. It was particularly noteworthy due to the combining of the Hamfest with the local Sunday Market and a Kite Flying Competition. It meant that there was lots of activities and entertainment for the ladies and children on the day, leaving the OMs to relax and look around the Ham goodies! Future convention organisers should keep Ballarat's success in mind...remember to cater for the whole family!

**NEW COMPUTER
CONTROLLABLE HANDHELD
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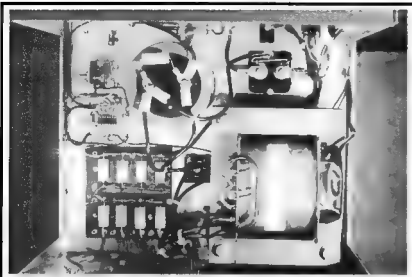
An exciting new Icom product has arrived, the IC-R10 Computer Controllable Handheld Wide Band Receiver and will be a real winner 500KHz-1300MHz/AM/FM/WFM/USB/LSB/CW and priced at \$765 (R.R.P. inc tax). Great value for a unit of this quality and performance.

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Internal view of the 20 A PSU.

with any other function) screw, lug, lock-washer and nut.

A linear power supply, when worked hard, generates a considerable amount of waste heat, which needs to be effectively dissipated. Do not skimp on heatsinking for the pass transistors. The two (10 A) or four (20 A) pass transistors must be fitted to an appropriately sized heatsink or sinks. That shown for the 10 A model measures 160 x 110 x 60 mm, and must be at least twice as big for the 20 A model. Always incline on the side of largeness, it will not be wasted. Remember, your PSU must give long, reliable service.

Quite good heatsinks may be obtained from junked colour TV sets, old main-frame computers, etc. Fins should run vertically for best effectiveness. Include the necessary insulating hardware and apply a safe heatsink compound or vaseline at the interface. Do not over-tighten the fixing screws. After assembly, with your multimeter on ohms, check that no shorts exist between the '3055 collectors and the heatsink. The Darlington driver Q1 may also be fitted to the main heatsink, or the rear panel as desired.

A 4-diode bridge will drop a total of about 1.2 V in each direction (0.6 V per conducting diode). If your transformer has, say, two separate 18 V/5 A or 8 A windings (giving 10 or 16 A DC output), then improved efficiency will be had by

using the windings in series, the centre tap being negative common, then one diode in each leg as shown as an alternative on the circuit. The diodes may be separate, or two diodes of a 4-diode bridge. Use a bridge with a rating of at least 25 A, and preferably 35 A at only slightly higher cost. The bridge assembly must be bolted to the bottom or rear panel, to act as a heatsink for this part.

An accepted rule of thumb for the main filter capacitor is about 2000 μF per amp of maximum current demand. A safe working voltage rating in this instance would be 35 V. "Computer grade" capacitors are the preferred type. If necessary, the required capacitance may comprise several smaller capacitors connected in parallel.

For ease of construction, the '723 may be fitted into a wire-wrap IC socket which, in turn, is soldered to a home-made circuit board. A rectangle of circuit board may be divided into lands or pads with a junior hacksaw, leaving spare lands for sense resistors R10 and R12. The lands form convenient tie points for wiring to other components. Carefully flare the IC socket pins to fit.

Make every joint a good one. Connections shown on the circuit with thick lines are those carrying substantial current, and should be made with insulated wire of at least 2 mm diameter copper. Ordinary hook-up wire will do for the remaining connections. For best

regulation to be obtained, the sense resistor connections must be wired away directly to the output terminals as shown on the circuit.

The 22 μF electrolytic, zener diode(s), voltmeter, and RF by-pass capacitors should be connected right at the output terminals. We suggest you make larger brass solder lugs for your terminals to accommodate these components. For an extra level of output protection (particularly for the 20 A model), use two zeners in parallel.

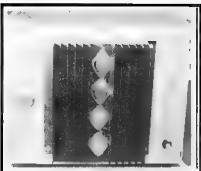
Meters are optional, although it is handy to know that the voltage is correct, and the amount of current being drawn. However, they are expensive items if purchased new. Those shown were obtained at modest cost from recent hamfests. Naturally, newer modern types command a higher price. Only the ammeters required the home-construction of a suitable shunt using Manganin resistance wire to convert a 1 mA meter to read 15 A or 25 A full scale deflection.

The 0.1 ohm (recent manufactured and marked R1, R being the decimal point) 5 W resistors may be mounted on an ordinary tag board or similar. Allow plenty of space between resistors, and make sure no other component or wire can come into contact with them.

Testing

Go over your wiring and confirm that all is correct. Pay particular attention to polarised components, including the filter capacitor, diode bridge, transistors, etc. With your multimeter on the highest ohms range, check that no stray grounds have occurred. When measuring between the positive terminal and chassis, then the negative terminal and chassis, you should read open circuit. The cause of a lower than megohms reading must be traced and rectified before applying power.

Remove the 15 or 25 A DC fuse, then apply mains power. Carefully measure the DC voltage across the main filter capacitor; it should be about 25 to 28 V. Switch off, then replace the DC fuse. Some output voltage should immediately appear due to the charge held by the filter cap. Apply power again. You should have about 13 or 14 V output. The voltage potentiometer



A typical heatsink arrangement on the 20 A PSU.

adjustment range is from about 13 to 14.2 V. Adjust the pot for 13.8 V.

Some sort of dummy load will be needed if you wish to test the PSU current capacity and voltage regulation. About 1.2 ohms (10 A) or 0.6 ohms (20 A) worth of resistance wire (probably nichrome) from an old heater element, and wound on a ceramic former, should do. Connection of the load should cause little or no change in output voltage, right up to, and probably a little beyond, the nominal maximum current capacity. Take care! The resistance wire glows red hot.

If desired, check the current limit function by temporarily applying a dead short across the output terminals. Voltage will fall to nearly zero, and current should limit at about 12 or 13 A (25 A). Removal of the short should restore output voltage, with no damage to the PSU.

Parts

The frugal procurement of the main components has already been mentioned. None of the parts is rare, but may seem costly if needed to be purchased new (and amateurs are notoriously penny-pinching aren't we?).

Near Melbourne we have the usual Dick Smith, Jaycar, Rod Irving, Altronics, TECS, etc electronics suppliers, and additionally Stewart Electronics and Rockby Electronics who can supply most of the required components. Rockby's (at writing) have a supply of reasonably priced 15,000 $\mu\text{F}/35\text{ V}$ caps. For heavier hook-up wire, try auto parts shops. The larger SAG style fuse and holder (for the DC fuse in the 20 A model) are known to be available from Dick Smith Electronics.

Our 0.1 ohm 5 W resistors were purchased from Rockby and Stewarts. Sheet aluminium and square rod may be bought from Capral (Alcan) outlets (check their off-cuts bin). For transformer winding wire, look up "electric motor and generator repairs" in your Yellow Pages™. If you need some Manganin resistance wire for your ammeter shunt, or dummy load, drop a line to Drew at the address shown below (free plus postage).

References and Further Reading

1. Home Brew Regulated Power Supply - Greenham, VK3CO, AR Jul 87.
2. Power Supply Transformers - Switzer, VK2SR, AR Apr 87 (simple how to re-wind).

3. Power Supplies on a Shoestring - Case, GW4HWR, Rad Com, Jul 86 (transformer re-winding).

4. 13.8 V Power Units - Hatch, G3ISD, Rad Com, Jul 83 (typical '72/3055 design methods).

5. VK Powermate - Simpson, Electronics Australia, May 78 (probably the one that started it all).

6. VK Powermaster - Electronics Australia, Mar 84 (became Dick Smith Kit 3448).

7. "The Serviceman" - Electronics Australia, Mar 92 (handy PSU troubleshooting tips).

8. The Foolproof Power Supply - Ewson, VK4SO, ARA, Vol 8 No 10.

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**19 Myoon Ave Moonah Park 3138

AR

WIA News

US President Clinton Recognises Amateur Radio

The US President, Bill Clinton, sent greetings to radio amateurs in America in the lead up to the Simulated Emergency Test held over 12-13 October, recognising amateur radio's value to the community, particularly during emergencies, according to *The ARRL Letter Online*.

Referring to 7-13 October as "Amateur Radio Week", the text of the message, signed by President Clinton, said: "In the past century, the medium of radio has changed the way we live and the way we view our world, and Amateur Radio operators have played a vital role in this communications phenomenon. Sharing knowledge and technological expertise, connecting computers via radio equipment, and linking people all across the globe, ham radio operators have helped to make our world a true global village. But even more important, they have provided a crucial lifeline of relief in times of disaster and hardship, ensuring that hope and help are on the way to those in need."

"Amateur Radio Week offers us a welcome opportunity to thank our nation's amateur radio operators for their commitment to excellence and their willingness to work for the well-

being of others. Best wishes for a wonderful week."

Special Prefixes for Hongkong

Hongkong hams have gained permission to change the numeral in their call signs to commemorate the transfer of sovereignty over the territory from the United Kingdom to the People's Republic of China (PRC) on 1 July 1997.

From September, they've been able to use 96, for 1996. Next year, they will be able to use 97, and in 1998 they'll be able to use 98.

According to the Hongkong Amateur Radio Transmitting Society (HARTS), Hongkong amateurs previously holding VS6-prefix call signs are allowed to continue using them up to 1 July 1997, while VR2-prefix licences have been issued for several years now in anticipation of a prefix change after 1 July 1997.

The VRA-VRZ block allocated by the ITU to the UK will be transferred to the PRC at that time and will be used by the Hongkong Special Administrative Region of the PRC after the changeover date.

HARTS said that details of a new award for amateurs contacting stations using the special prefixes will be announced in the future.

Computer Program

Maidenhead Locator Program

John Martin VK3KWA describes a simple computer program to calculate the increasingly used Maidenhead Locator squares.*

For those who are not yet familiar with it, the Maidenhead Locator system is in common use on VHF and UHF, to enable positions to be identified using a combination of letters and numbers.

The first two letters of the identifier refer to coarse squares, measuring 20 degrees longitude by 10 degrees latitude. These squares start where the international date line meets the South Pole, and move north and east from there. The starting point is therefore 180° W 90° S, at the lower left-hand corner of square AA. The first letter increments as you move east, and the second letter increments as you move north. The highest letters are RR.

Each square is divided into 100 smaller squares, arranged 10 high by 10 wide. The square at the lower left is 00, and the one at the upper right is 99. As with the letters, the first number increments as you move east, and the second increments as you move north. The letters and numbers form the four digit locator, eg QG62 for Brisbane.

These locators cover a north-south distance of around 111 km, and an east-west distance ranging from 222 km at the equator to zero at the poles. Although handy for locating another station on a map, four digit locators can only provide very rough distance estimates.

For increased accuracy, each four digit locator is subdivided into 24 x 24 "sub-squares", which are identified by two additional letters. Each sub-square covers 5 minutes of longitude by 2.5 minutes of latitude, or about 9.28 by 4.64 km at the equator. Six digit locators can therefore give a distance measuring accuracy of around plus or minus five km, which is good enough for most purposes.

The following program provides a quick and easy way to:

- (a) convert latitude and longitude to a six digit Locator;
- (b) convert a four or six digit Locator to latitude and longitude;
- (c) calculate the distance between two lat/long positions; and
- (d) calculate the distance between two Locators.

For the sake of simplicity, the program uses a straightforward formula which assumes that the earth is a perfect sphere. The accuracy is limited to a few km and results are rounded off to the nearest kilometre. If you enter station

co-ordinates in the form of Locators, the margin of error is greater. The program calculates the distance between the centres of the two Locator squares, but of course the two stations could be located anywhere within their respective squares.

The original version was written in 1990, and has now been updated and runs under GWBASIC or QBASIC.

Be careful when typing the program in, especially with the mathematical and punctuation symbols. Be especially careful with brackets, commas, colons and semi-colons. In lines 85 and 505, there should be no space between the pairs of quotation marks. Also, ensure that in lines 120 and 130, the letters "S" and "W" appear once in upper case and once in lower case.

If the program crashes, it will almost certainly be due to a typing error. To keep the program simple, it has no error trapping. You can get ridiculous results if you enter impossible figures such as latitudes greater than 90 degrees, or locators with any digit greater than RR99XX.

For those who do not like typing

Program Listing

```
10 REM DISTANCE - LOCATOR PROGRAM
12 REM WRITTEN BY JOHN MARTIN, VK3KWA, NOVEMBER 1996
16 REM
20 DEF FNA(X) = ATN(ABS(SQR(1 - X ^ 2) / X))
25 DIM C(6): DEFDBL E, N: PI = 3.14159265#
50 CLS: PRINT "Distance - Locator Program: Amateur Radio December 1996"
55 PRINT "=====
60 PRINT "1 Convert Lat and Long to Locator"
65 PRINT "2 Convert Locator to Lat and Long"
70 PRINT "3 Find Distance between 2 Lats and Longs"
75 PRINT "4 Find Distance between 2 Locators"
80 PRINT "<1-4> your choice <ANY OTHER KEY> to quit". PRINT
85 KS = INKEY$. IF KS = "" THEN 85
90 K = VAL(KS): IF K < 1 OR K > 4 THEN END
95 ON K GOSUB 100, 200, 300, 400: GOTO 60
100 PRINT "DMS TO LOCATOR CONVERSION"
105 PRINT "Enter the latitude and longitude in degrees, minutes and seconds "
110 PRINT "Type the three figures separated by commas "
115 INPUT "Latitude ", ND, NM, NS: NM = ND * 60 + NM + NS / 60
120 INPUT "North or South (N/S) ", NSS: IF NSS = "S" OR NSS = "s" THEN NM = -NM
125 INPUT "Longitude ", ED, EM, ES: EM = ED * 60 + EM + ES / 60
130 INPUT "East or West (E/W) ", EWS: IF EWS = "W" OR EWS = "w" THEN EM = -EM
135 ER = EM * PI / 10800: NR = NM * PI / 10800: E = 10800 + EM: N = 5400 + NM
140 C(1) = INT(E / 1200): E = E - C(1) * 1200
145 C(3) = INT(E / 120): E = E - C(3) * 120: C(5) = INT(E / 5)
150 C(2) = INT(N / 600): N = N - C(2) * 600
155 C(4) = INT(N / 60): N = N - C(4) * 60: C(6) = INT(N / 2.5)
160 LS = "". RESTORE DATA 65, 65, 48, 48, 65, 65
165 FOR N = 1 TO 6: READ D(N): LS = LS + CHR$(D(N) + C(N)) NEXT
170 PRINT "Six digit locator is "; LS
175 IF K = 3 THEN RETURN
```

```

180 GOSUB 500 IF Q = 1 THEN 105 ELSE RETURN
200 PRINT "LOCATOR TO DMS CONVERSION"
205 INPUT "Enter the 4 or 6 digit locator: "; L$, L5 = L$ + "MM"
210 FOR X = 1 TO 6
215 C(X) = ASC(MID$(L$, X, 1))
220 IF C(X) > 96 AND C(X) < 123 THEN C(X) = C(X) - 32
225 NEXT
230 E = -180 + 20 * (C(1) - 65) + 2 * (C(3) - 48) + (C(5) - 65) / 12
235 N = -90 + 10 * (C(2) - 65) + (C(4) - 48) + (C(6) - 65) / 24
240 ER = E * PI / 180; IF E < 0 THEN ES = "West" ELSE ES = "East"
245 NR = N * PI / 180; IF N < 0 THEN NS = "South" ELSE NS = "North"
250 ES = 3600 * E - 150 * (LEN(L$) = 8); ES = ABS(ES); ED = INT(ES / 3600)
255 ES = ES - ED * 3600; EM = INT(ES / 60); ES = CINT(ES - EM * 60)
260 NS = 3600 * N - 75 * (LEN(L$) = 8); NS = ABS(NS); ND = INT(NS / 3600)
265 NS = NS - ND * 3600; NM = INT(NS / 60); NS = CINT(NS - NM * 60)
270 PRINT "Co-ordinates at the centre of the square are:"
275 PRINT "Latitude ", ND, " deg ", NM, " min ", NS, " sec ", NS
280 PRINT "Longitude ", ED, " deg ", EM, " min ", ES, " sec ", ES
285 IF K = 4 THEN RETURN
290 GOSUB 500 IF Q = 1 THEN 200 ELSE RETURN
300 PRINT "DISTANCE BETWEEN TWO DMS CO-ORDS"
305 PRINT "Co-ordinates of Station 1:"
310 GOSUB 105: E1 = ER, N1 = NR
315 PRINT "Co-ordinates of Station 2:"
320 GOSUB 105: E2 = ER, N2 = NR
325 AN = COS(E1 - E2) * COS(N1) * COS(N2) + SIN(N1) * SIN(N2)
330 AC = FNA(AN); IF AN < 0 THEN AC = PI - AC
335 D = INT(AC * 6367)
340 PRINT "Approx. distance (km): "; D
345 IF K = 4 THEN RETURN
350 GOSUB 500 IF Q = 1 THEN 300 ELSE RETURN
400 PRINT "DISTANCE BETWEEN TWO LOCATORS"
405 PRINT "Station 1"
410 GOSUB 205: E1 = ER, N1 = NR
415 PRINT "Station 2"
420 GOSUB 205: E2 = ER, N2 = NR
425 GOSUB 325
430 GOSUB 500; IF Q = 1 THEN 400 ELSE RETURN
500 PRINT "<RETURN> to do another one <ANY OTHER KEY> for menu"
505 QS = INKEY$. IF QS = "" THEN 505
510 IF QS = CHR$(13) THEN Q = 1 ELSE Q = 0
515 PRINT RETURN

```

programs, a more sophisticated version is available as an .EXE file. It uses a more complex method of calculation, and has an accuracy of 100 metres. It calculates both short and long path distances and beam headings, has full error trapping, and will beep politely at you if you try to enter anything that would cause a wrong answer. To receive a copy, send a disk (any IBM format) in a suitable mailer with return postage to John Martin VK3KWA (QTHR).

For interest, here are the locators for the capital cities around Australia (where two locators are shown, you will have to determine whether you are north or south of a 1 degree latitude line passing through your city):

Canberra QF44
 Sydney QF55/56
 Melbourne QF22

Brisbane
 Adelaide
 Perth
 Hobart
 Darwin

QG62
 PF94/95
 OF77/78
 QE36/37
 PH57

References and Further Reading

1. "Maidenhead Locators for Australia", Chris Dimitrijevic VK3FY, *Amateur Radion* (p28), January 1985.
2. "Finding One's Maidenhead Locator", Frank Beech VK7BC, *Amateur Radio*, November 1987.
3. "Using Locators", John Martin VK3JZC/VK3KWA, *Amateur Radio*, December 1990.
4. "Distance Estimating Program", John Martin VK3JZC/VK3KWA, *Amateur Radio*, January 1991.

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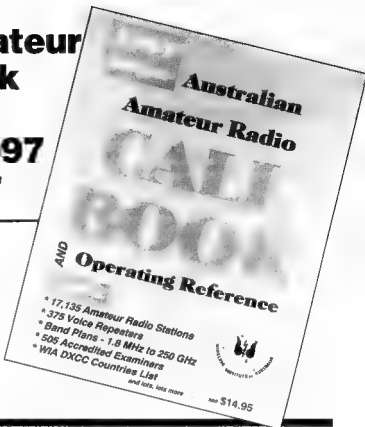
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■ Book Review

Australian Amateur Radio Call Book and Operating Reference - 1997

Publisher: Wireless Institute of Australia

Reviewed by: Bill Rice VK3ABP



You've just heard a rare prefix on 20 metres. What country is it? Of course, look it up in the latest *Call Book*!

Prefixes keep changing these days, with all the political changes going on, so you need a recently updated list. In the *1997 Call Book*!

You're driving somewhere on holiday far from home. What repeaters are within range on your FM mobile? What band and channels? They're all listed in the *1997 Call Book* (packet too!).

One of the family who has just moved in across the road sees your antennas and calls in to ask what they are. What do you tell him/her about amateur radio? How can they find out what it's all about? How do they get a licence? It's all in the *Call Book*.

Which part of what band can you use for which mode of transmission? All the Band Plans are there, from 1.8 MHz to 250 GHz!

And, of course, the names and addresses of all Australia radio amateurs are listed (except for a few who prefer them suppressed). Over 17,000 licences, with hundreds of changes since last year, hundreds of new call-signs (maybe even thousands!).

How can you maintain an amateur station without a current *Call Book*? Only \$13.00 at your Divisional Bookshop, or \$14.95 at your favourite radio/electronics store.

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■ Antennas

Random Radiators

with Ron Cook VK3AFW and Ron Fisher VK3OM*

Bytes and Pieces

Some time ago I had a few moments to spare and looked at a News Group on the computer mail system. It went by the name of *rec.radio.amateur.antenna*. I've not had the time to look at it recently, but here is a sample of some of the information that can be gleaned from there.

CB Whip Mods

Chris Moore said it occurred to him that he should be able to get a CB magnetic mount antenna and trim it a bit to use on 10 m. Brian N5PSS replied that a better bandwidth would result if the coil were shortened rather than the whip.

Comment: This may be true, although the difference may not be very great. A CB antenna is a good starting point for an inexpensive 10 m antenna. The critical part

of a loaded whip is the bottom section. This carries the highest current and radiates the signal. The lower the losses here and the greater the fraction of a quarter wave, the higher the efficiency and the better it will work. The loading coil and the top whip provide the inductance and capacitance to make the whole resonant.

Reducing the size of the coil will reduce its losses, but the Q may also be reduced and so increase the bandwidth. Why will taking a few turns off a coil decrease its Q? The theory goes like this. The inductance of a coil is proportional to the square of the turns and Q is proportional to the ratio of inductance to resistance. The resistance will be proportional to the number of turns. So, reducing the turns by half will reduce the resistance to one-half, but it will also reduce the inductance to one quarter. So, the Q will

reduce to half and the bandwidth will double. In practice there will be other complications so that the change might be a lot less.

If a CB whip is altered to resonate on 28 MHz, then adjusting the coil is likely to be the most satisfactory option. Any change in its performance will be slight and may be for the better. Don't forget to use heat shrink tubing or plastic tape to waterproof the modified coil.

For reduced size antennas, increased efficiency normally means reduced bandwidth. Therefore, if a signal comparable with a full size antenna is desired, some loss of bandwidth must be accepted. If you have a small antenna that has a flat VSWR it is likely to be lossy and might make a better dummy load than an aerial.

Attic Antennas

In response to a request for ideas on an antenna that could be hidden in an attic and had to be less than 50 feet long, Bob KF8PH replied as follows: "I have four indoor HF antennas in the rafters. You could make a good 20 m dipole. You might also consider making a loading coil using some PVC pipe."

He goes on to say, "Indoor antennas are fun to experiment with. They do not compare with outdoor antennas, but that makes them no less fun."

Comment: Chapter 6 of The ARRL Antenna Book, 17 Ed. has an excellent treatment of single coil, two coil and linear loading of dipoles to reduce their length with minimal reduction in performance. While a full size 40 m dipole supported on 30 m masts might be excellent, it is not practical for most of us. A shortened dipole at 8 metres (25 ft), or one in the roof, is infinitely better than none at all. An antenna that is only 10% efficient and not placed in an optimum situation still can be within 2 to 4 S units of a full size dipole at a moderate height.

Brazing Rod Elements

In reply to a query as to whether brazing rod was a good material to use for antennas, Doug VK4ZDR replied, "Be aware that common brass brazing rod has a high proportion of phosphorus and other materials in its composition. These all help to make it a better welding rod, however, they increase the resistivity of the material and degrade the antenna performance. Even aluminium welding rod contains some silicon and/or magnesium and so has increased resistivity. Normal aluminium has a much lower resistivity and, provided you make joints that do not oxidise over time, should provide better performance. I use a eutectic aluminium brazing rod 'Techni-2000' to braze all aluminium-aluminium

joints on the antennas I fabricate. Only a normal gas torch is needed for this. The rod melts at about 200 degrees less than aluminium does, but care must still be exercised."

Open Wire Feeder

Jim W2XO comments on making open wire feeder. "I have constructed 'ladder line'... from electric fence materials. You can get three foot rods of fibre glass used as insulators for electric fences from farm stores. They also stock some wire. Hopefully you can find copper-clad steel, but aluminium will work and is usually sold in 1/4 mile spools. #14 is about \$25.

"I made six inch spacers by cutting up the fibre glass rods and drilled a hole near each end for the wire to pass through. I then drilled a hole on axis and threaded in a sheet metal screw to clamp the spacer on the wires. It is easy to assemble, just cut two lengths of wire and lay them side by side across the lawn. Fasten them at one end and thread on the spacers, about two per foot. Walk the spacers down the wires to get an even spacing and tighten the sheet metal screws.

"I am going to try a simpler construction next time. I'll put a saw slot in the ends of the spacers and use epoxy to hold them in place. This will eliminate the need to walk the spacers down the wires.

"The result is a line with about 550 ohms impedance. I currently use a 120-foot dipole fed with the stuff that works fine from 160 through 10 metres. It's probably not significantly better than the store bought stuff with the #18 wire, but it does resist degradation from snow and ice better due to the wide spacing. Most of all it LOOKS NEAT, just like a 1938 QST cover picture!"

Elevated RF Ground

In reply to a question from Chrs N8PBJ on how to get a good ground when on the second floor, Cecil KG7BK replied: "Attach a 1/4 wavelength of wire for each band you want to run to the ground lug of your equipment. These wires may be routed around the edges of your room. The ends of these wires are high RF voltage points, so insulate them well. This scheme is known as a counterpoise and will give you an excellent RF grounding system. Please note the caution about insulating the ends. At 1 kW the voltages are lethal. Even at 100 watts the voltages present at the ends of the wires can burn you badly."

Comment: For the lower frequencies the wire length is inconvenient. A much shorter wire can be used if resonated using an ATU. In fact, such units are available from commercial sources.

Bill W1LZP commented: "If a properly balanced antenna was used an RF ground

would be unnecessary. RF in the shack is RF that is not being radiated and, rather than use an RF ground, it is better to pay more attention to the antenna."

For safety purposes a good mains ground is always required.

El-Cheapo Low Profile Antenna

In conclusion, a comment from James WY9F about inexpensive and low profile antennas.

"I have a home built, 7 band (10, 12, 15, 17, 20, 40 and 80 m) ground-mounted wire vertical; 40 and 80 m are 'loaded'. I used a piece of 2.5" PVC pipe about 9" long to wind a substantial loading coil. I used PVC end-caps on both ends, with a ground rod protruding through the bottom one. A female coax connector is located near the bottom, with the 'shell' connected to the ground rod, and a dozen or so radial wires that also come out of the bottom. The centre conductor goes to the bottom of the loading coil.

"The top PVC end-cap has five holes drilled around the circumference, through which nylon line is tied. The other ends of the lines are tied to a similar sized disk mounted (via a spring) to the peak of my house with a screw eye. Thus, I have a 5 "strong" trellis running from the ground to the peak of the roof.

"Along these strings I have tie wrapped some 18 gauge wires, each cut to quarter wavelengths for the five bands, 10 to 20 m. They are bonded at the bottom to the top of the coil.

"Inside the pipe are relays that allow shorting the coil for 10 - 20 m operation. The full coil resonates the 20 m wire for 80 m CW. Taps on the coil are used for the phone section of 80 m, and also the CW and phone sections of 40 m. The relays are selected by combinations of the taps.

"Tuning is a bit tricky as there is some interaction between the wires. If you use the standard 234/f formula, you are most certainly going to be "long", so trim down from there.

"I've had good luck with it although I have no experience with "store bought" antennas. If I had to do it again I'd probably spread out the wires more (less interaction), and use real RF relays instead of the Bosch 30 A automotive relays. I think RF burned one of them out - shouldn't have switched it while talking.

Final Comment: Well, even with RF relays it is not a good idea to switch with RF applied. Apart from giving the contacts a hard time it is not good for the transmitter.

73 from him and 73 from me
*Chs PO Box 2175, Cranfield, New South Wales 2131

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ALARA

Sally Grattidge VK4SHE*, ALARA Publicity Officer

Apres ALARAmeeet

The ALARAmeeet in Perth is now part of our history, and was a very enjoyable and successful event from what I have heard. Bev VK6DE can relax knowing she has done a splendid job helping old friends meet again and new ones discover each other, all with many happy memories of their time in WA. Meanwhile, there must be some nice little side stories waiting to be told, so if something amusing happened to you, or you spotted someone doing, wearing or eating something unusual, do tell. Here is your chance to give national coverage to those embarrassing moments and let the rest of us have a good laugh at your expense.

After the meet, Dot VK2DDB travelled south to Pemberton where she not only saw the famous Gloucester tree, but climbed it! This giant Karri at 60 m is the highest lookout tree in the world; it was pegged in 1946 and named after the Duke of Gloucester. Dot will have a hard time persuading the OM to climb the tower for

her after that.

Even further south near Albany, Dot's OM John VK2ZOI had missed a turning and was heading for a roundabout to do a U turn, when the fured van containing the ZLs from the ALARAmeeet was spotted. John sent CQ on the car horn as they followed the van round the roundabout to attract their attention.

Gwen VK3DYL enjoyed the trips organised for the Meet and the opportunity to see something of WA. Elizabeth VE7YL stayed with Gwen in Melbourne for a few days attending the monthly VK3 luncheon and a party in her honour as well as meeting old friends among the local DXers. Please note that there will be no VK3 luncheons in December or January

Welcome New Member

Ruth VK1YL joined at the ALARAmeeet. It looks like Ruth will be VK1 Rep unless she can persuade another VK1 YL to join her.

Silent Key

The members of ALARA extend sympathy to Jenny VK5ANW, whose OM Bill VK5AWM passed away suddenly on 27 October.

Congratulations

Marlyn VK3DMS has won another Vermeil medal for her stamp collection. Last year she was one off the gold in a national competition, and this year she is two off the gold in an international event. Most people drop two places when they go international, but then Marlyn is not most people.

JOTA

I know many YLs take part in JOTA, so if you had an interesting time, please let me know about it. I had an enjoyable weekend, apart from minor panic after discovering I had left a vital bit of coax back at the shack, but a replacement was found and all went smoothly. I was introduced to a culinary delight known to the Scouting fraternity but new to me. That is the cooking of a hot dog in a milk carton. You assemble a cold dog, wrap in foil, place in empty milk carton, ignite (not on the kitchen table, kids!) and within a few minutes you have - a cold sausage in a burnt bun.

ARDF ZL Style

Hot news from Anne ZL3VR is that the First NZ Radio Orienteering Championships will be held in Chrschurch at Easter 1997 on 28 to 31 March. If there are sufficient YL competitors of mature years, sections will be arranged so you do not have to run against 20 year olds!

There will be HF and VHF courses, and \$50 covers both events, lunches transport and the final dinner. Accommodation at very reasonable cost is available at Chrschurch Boys High School. Those without their personal "sniffers" will be able to hire equipment on a first come basis.

Registration forms should be in December *Break In*, or contact Ron Godkin ZL3TO, phone 03 3388 0043, or Ann McMaster ZL3VR, phone/fax 03 327 8278.

Rockhampton Rocks

Robyn VK4RL and her District Radio Ladies kept their usual high profile at the Central Queensland Amateur Radio Convention in September. A display table was set up with a craft section with prizes donated by Mary VK4PZ and judged by Dianne Kavanagh. Later that night the ladies dressed in Shirley Temple costumes complete with lollipop and sang "The Good Ship Lollipop" as part of the after dinner entertainment. The DRLs are also meeting for lunch once a month and celebrating birthdays and any other excuse for a party; so, if you are in the area any time, contact



Robyn and she will probably organise one for you.

CLARA 97 Gala Celebration – September 26, 27, 28

Come and join us for a great weekend! Great prizes, great fun, great people. We are CLARA OMs are welcome. Registration by 31 January 1997 attracts a discount. Activities include a visit to the Fred Hammond Radio Museum, dinner theatre, home brew and entertainment (what can you contribute?), three forums, dinner and dance, plus the Yavir Ukrainian Dance Group and a Sunday morning Bon Voyage breakfast. If you are planning to visit Canada in 1997 make sure you are in Aurora, Ontario in September. Dot VK2DDB has more details, or contact Cathy Hrischenko VE3GJH, 13451 Concession 1, RR 1 Zephyr, Ontario LOE-1 TO Canada.

Christmas Greetings

Christmas greetings from the YLs of ALARA to those who talk and those who listen, and all those OMs who come to our aid with ladders and soldering irons. Enjoy the festive season and drive safely so that we can all meet again in 1997.

*C/o PO Woodstock QLD 4R16 Tel 077 78R 642 or

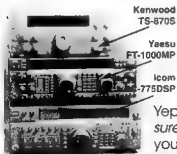


Back row: Bev VK6DE, Myrna VK5YW, Rajja SMOHNV, Christine VK5CTY, Lynda Francis, Trish VK6QL, Joan VK6JMP, Marlene VK3WQ, Poppy VK6YF, Val VK6VR, Marion ZL3TVF, Betty ZL1UBZ, Biny ZL1AZY, Judy VK3AGC, Tina VK5TSK, Christine VK6ZLZ, Cathy ZL2ADK, Shirley (daughter of Norma VK6PNS).

2nd row: June VK4SJ, Gwen VK3DYL, Margaret VK3DML, Robyn VK4RL, Eileen ZL1BRX, Win ZL1BBN, Almee FK8FA, Norma VK2YL.

3rd row: Helene VK7HD, Pat ZL1LD, Peggy VK6NKK, Celia ZL1ALK, Elizabeth VE7YL, Aola ZL1ALE, Ruth VK1YL, Norma VK6PNS, Pam VK3NK.

Front row: Dot VK2DDB, Tina VK5TMC, Muriel XYL de VK3KNM, Jill ZL2DBO, Carol ZL2VQ, Fiona XYL de VK6JKR, Bev VK4NBC, Ann VK4ANN.



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Of course, December's R&C has much more than that! Here are just a few of our Christmas feature stories...

- **Slow-scan TV.** A new column about SSTV. Here's what you need to get going. Hey, it's coming back!!
- **Review: Icom IC-17A.** If you haven't bought a hand-held for a few years, this will really shock you...
- **Reader Competition:** Win a Yaesu FT-50R. Just fill in the form and wait for your phone to ring...
- **Modifications:** a most popular amateur column. This month loads of Icom, plus Yaesu and Alinco.
- **The History of Telegraphy.** We bet you don't know all the amazing history of telegraphy. Remarkable!
- **Review: Optoelectronics Explorer.** A really weird \$1700 gadget which can reveal a lot around you...
- **The best IOTA column in Region 3, three DX columns and more...** all the best regulars every month!

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(PS. We also have the biggest collection of radio-oriented Classified adverts in the country. There's lots of them because they work so well. Ask your newsagent to keep a copy for you each month, or ring 1800 25 2515 for subscription details. Hurry – you might miss something!)

AMSAT Australia

Bill Magnusson VK3JT*

National co-ordinator

Graham Ratcliff VK5AGR

Packet: VK5AGR@VK5WI

AMSAT Australia net:

Control station VK5AGR

Bulletin normally commences at 1000 UTC, or 0900 UTC on Sunday evening depending on daylight saving and propagation. Check-ins commence 15 minutes prior to the bulletin.

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Secondary 3.685 MHz (usually during winter).

Frequencies +/- QRM.

AMSAT Australia newsletter and software service

The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

AMSAT Australia

GPO Box 2141

Adelaide SA 5001

It will now have to be that last QSO through OSCAR-13, chances are you've left it too late. Don't expect the satellite to remain operational until the moment of re-entry. Relatively flimsy items like antennas will be the first to be destroyed by the heating and no antennas mean no signals in or out. Once that happens we will have to rely on NASA's radar tracking to tell us when OSCAR-13 is no more.

Of course, it may all happen rather quickly. No-one knows for sure; the demise of man-made satellites is a notoriously unpredictable business. Remember Sky Lab? It wasn't until the last orbit that accurate data could be obtained. I've been listening and operating AO-13 as much as possible for the last few weeks and recording the telemetry. I must say that it's been good to see lots of activity to send our old friend off.

AO-10 has been there also with good signals, often rivaling AO-13 in signal level and activity. In next month's column I should be able to give some details of the final hours of AO-13. The January column traditionally includes the latest summary of active OSCARS. It will be rather sad not to see AO-13's listing there. It had been hoped to extend the useful life of AO-13 a little longer by re-orienting the satellite to 90.0 but it proved too difficult due to very fast perigee fly-bys and crippling Doppler shift. A very slow change to 180.0 was agreed upon as the

best possible solution and this was to be implemented in early November

1996 And All That

What a year it's been in the amateur radio satellite business. It began with the appointment in February of Graham VK5AGR to the post of IARU AMSAT Frequency Co-ordinator. The importance of this post cannot be overstated. Graham was chosen because of his extensive experience as southern hemisphere control station for AO-10, AO-13 and P3D. In March it was announced that the replacement for JAS-1b, the new JAS-2, was nearing completion.

April saw the creation of AMSAT-France, a new amateur radio satellite body in France. It was also in April that Ron Parsons K5RKN introduced his full Doppler control program. April was a busy month. It saw the launch of "Project Argus" by the SETI League. This project is designed to allow amateur radio operators and amateur astronomers to participate in SETI, the recently re-formed Search for Extraterrestrial Intelligence.

In May the announcement was made that the launch date was set for "SunSat", a new amateur radio satellite built in South Africa. SunSat will have a strong educational role.

June saw details published of the SCOPE camera to fly on P3D. SCOPE is being developed in Japan.

July gave us the introduction of another station control program, this time for the ubiquitous FT-736 transceivers.

Yet another prestigious award was announced in August. Karl Meinzer DJ4ZC was awarded the Horkheimer prize for his

Things are Hotting Up!

Evidence of OSCAR-13 perigee heating is obvious in the whole-orbit-data extract published by James G3RUH last month (Fig 1). The trace covers two perigees on 21 October and it's quite easy to see the sharp rise in temperature as OSCAR-13 ploughs through the upper reaches of the atmosphere on its closest approach to earth each orbit.

A week after the telemetry shown in Fig 1 was recorded, the satellite encountered eclipses around perigee. It will continue to enter the earth's shadow each perigee until its final re-entry. Fig 2 shows that the cooling effect of the lack of sunlight was more than enough to counteract the heating effect of the pass through the upper atmosphere. Control stations are monitoring the rate of change of this heating and indications are that, by the time you read this, OSCAR-13 will be very close to re-entry, which has been predicted for some time now to be around the first or second week in December.

At the time of writing, InstantTrack was reporting the perigee height of AO-13 as less than 100 km. This is critical and things will start to melt before too long. If you've left it

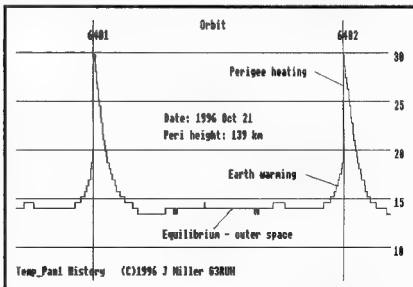


Fig 1 - A whole-orbit-data extract of OSCAR-13 showing perigee heating.

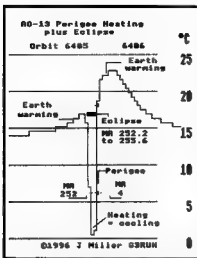


Fig 2 - A data extract from OSCAR-13 showing that the cooling effect of the lack of sunlight was more than enough to counteract the heating effect of the pass through the upper atmosphere.

contributions over time to the technical art of amateur radio satellites. August also saw the successful launch of JAS-2.

The long awaited MIR 70 cm operations began in September and plans were announced in October for an ambitious project to include MIR/SAFE in the world's amateur radio TCP/IP network.

In October it became known that a new amateur satellite to be called Maelle was under construction in France. The project had won an important engineering prize a few months earlier. Awarded to commemorate the 100th anniversary of the first radio transmissions, it was presented by Joseph Taylor, Nobel prize winner in physics for the discovery of binary pulsar stars. Joseph revealed that his interest in science had first been awakened by practising amateur radio. Details also came to hand in October of another satellite being built at UoS. Called Merlion, it will carry an amateur radio package including extensive experimental digital comms capable of megabit rates and requiring microwave equipment at the ground station. It will be used for commercial purposes during the week and be switched to amateur bands on weekends.

This summary is not exhaustive, as each new bird would require a complete column to cover adequately. It serves, however, to

show that the amateur radio satellite scene is very much alive and well and looking forward to the start of the new millennium.

New MIR Frequency Plan

After much discussion it has been decided by the IARU Region 1 conference that the two metre frequencies used by MIR crews for amateur radio operations should change. In future, packet operations will be on 145.800 MHz FM and voice operations will change to duplex. MIR will transmit on 145.800 MHz and listen on 145.200 MHz.

Next Month

The usual six-monthly update of operational amateur radio satellites.

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Awards

John Kelleher VK3DP - Federal Awards Manager*

ZL2000 Award

The amateur fraternity is fast heading into a new century, with the year 2000 rapidly approaching. To acknowledge this event, the Gisborne Amateur Radio Club (Branch 11 NZART) have instigated an annual award until the year 2000 using the callsign ZL2000.

The award, to be known as the "Gisborne 2000 Award" highlights the fact that Gisborne, New Zealand, is unique in being the first City in the world to greet the sunrise on a new day, and the New Year. Gisborne will be the centre of attention for much of the world during the New Year period of the year 2000.

As this is an International award, it is therefore open to all amateur radio operators and SWLs. To achieve an annual award, only ONE contact is required with a ZL2000 station during the month of January each year, until the year 2000.

A special complimentary Award will be issued to all stations that contact a ZL2000 station for FOUR out of the possible five years of the award, up to and including the year 2000. One of these complimentary award recipients will receive a very special award in the year 2000, the details of which will be released at a later date.

The fee for the annual award in New Zealand is \$NZ5.00. For VK operators \$AUS5.00, and for the rest of the world, \$NZ10.00. All correspondence and Award applications should be sent to: Gisborne 2000 Award, PO Box 1017, Gisborne 3815, New Zealand.

Rules for the ZL2000 Award

(1) The Award will be available to all licensed amateurs and SWLs.

(2) Only ONE contact is eligible per year with one of the Gisborne stations using the ZL2000 callsign

(3) All operators using the ZL2000 callsign must be full members of the Gisborne Amateur Radio Club

(4) Any valid amateur frequency may be used by Phone or CW.

(5) Contacts can only be made during January of each year.

(6) The Award commences at 0001 hrs (NZ time) 1 January 1997 (1101 UTC 31 Dec 1996) and concludes 2400 hrs (NZ time) 31 January 1997 (1100 UTC 31 January 1997) each year including the year 2000.

(7) All valid contacts with ZL2000 will be sent a QSL card via the NZART QSL Bureau

(8) The Award for each year will be issued upon receipt of the prescribed application fee

(9) The application fee for the award should reach the Award Manager by 30 June of the operating year. (Late entries will be processed at the discretion of the ZL2000 Award Committee.)

(10) A different pictorial award will be issued each year

(11) Any operator or SWL, collecting four awards, including the year 2000, will be issued with a complimentary award.

(12) One amateur operator or SWL, meeting the requirements of Rule 11, will be chosen to receive a special award in the year 2000.

South Korea (Korean Amateur Radio League Series)

General requirements. The fee for each award is \$US4.00 or eight IRCs (\$US2.00 or four IRCs for each HLA sticker). If cards are submitted, include IRCs for return postage)

HL9s, US military contacts, are NOT VALID. Contacts must be made after 3 February 1959. All contacts must have been made from the same call area.

Apply to: Korean ARL, CPO Box 162, Seoul 100, Korea.

All Korea Award (AKA)

Issued for proof of contact with the seven different HL call areas 1, 2, 3, 4, 5, 8, and 0.

All Province Awards (APA)

Awarded for proof of contact with HL stations in each of the different special cities and provinces of Korea.

Area 1, City of Seoul. Area 2, Incheon City, Kyonggi-do, Kangwon-do. Area 3, Chungcheongnam-do, Chungcheongbuk-do. Area 4, Chollanam-do, Chollabuk-do, Chedu-do. Area 5, Pusan City, Taegu City, Kyongsangnam-do, Kyongsangbuk-do

HL Award

Issued for HL (except HL9) contacts. The following classes are available:

Class K = 5 QSLs required; Class O = 10 QSLs; Class R = 20 QSLs; Class E = 30 QSLs; and Class A = 50 QSLs required.

Korean District Number Award (KDN)

Issued for proof of contact with HL stations in each of 50 cities, Guns or Gus in Korea. Available endorsements for 100, 150, etc upon submission of cards with list prepared in order of KDN reference numbers.

The HL9 Award

Contact HL9 stations after 1 January 1987 in one or more of five different endorsements each of which requires five contacts, CW, SSB, RTTY, packet or 5-Band, requiring five per band. GCR list and \$US4.00 or four IRCs to: Rainer Herden KB5LIJ, Top Mansion D-1, 135-3 Itaweon-Dong, Yongsan-Ku, Seoul 140-200, Republic of Korea

Worked All Korea Award

Issued by the Korean DXers Society for contacting Korean stations as follows: before 1 January 1981 you need 1-HL9 and 1-HM station; after 1 January 1981, 1-HL9 and any HL other than HL9 (special endorsement given for each of HL1, 2, 3, 4, 5, 8, 0). You may substitute three different HLs for a missing HL9. SWL OK. No band or mode restrictions. GCR list and \$US4.00 or 10 IRCs to: Byong-joo Cho HL5AP, Chairman Korean DXers Society, PO Box 4, Haemundae, Pusan Korea 607-04.

Korean Ladies ARC Award

Class A: from each call area HL1, 2, 3, 4, 5, 8 (Portable) and HL0 (Club Station) collect a QSL card from a YL operator. YLs operating from a Club is OK, and a YL station operating portable in a needed district is OK.

Class B: collect 15 different YL operators cards. An HL0 YL operator is valid from a Club station. Contacts after 1 January 1985. SWL OK. GCR list and fee of eight IRCs to: Cho Chun Taek HL1ASD, Korean Ladies ARC, #401 ho, 328 dong, Jukong 3 Danji Apt. Banpo Dong, Seocho-ku, Seoul 137-040, Korea.

Kuwait

The Kuwait Award

Contact any 10 9K2 stations on any band or mode. No date limitations. GCR list and five IRCs to: Kuwait Amateur Radio Society, PO Box 5240, Safat 13053, Kuwait.

Kuwait National Day Award

On 25 February each year, the State of Kuwait celebrates its National Day. On that day you can earn the KNDK by contacting either five different special prefix 9K25 stations or contact two different 9Ks plus the Kuwait ARS station 9K25RA. SWL OK. The eligibility period starts 0001z on 25 February ending at 2400z. The award may be earned annually GCR list, and a fee of five IRCs to: Award Manager 9K2MJ, Kuwait ARS, PO Box 5240, Safat 13053, Kuwait

Good hunting

*PO Box 2175 Canfield Junction 3161

ar

Contests

Peter Nesbit VK3APN - Federal Contest Coordinator*

Contest Calendar

December 96 - February 97

Dec 6-8	ARRL 160 m Contest	(Nov 96)
Dec 14-15	ARRL 10 m Contest	(Nov 96)
Dec 21-22	Croatian CW Contest	(Nov 96)
Dec 26-Jan 26	Ross Hull VHF/UHF Contest	
Dec 29	RAC Canada Winter Contest	(Nov 96)
Dec 31	ARRL Straight Key Night	
Jan 4-5	ARRL RTTY Roundup	
Jan 10-12	Japan International DX CW (Low Band)	
Jan 11-12	VHF/UHF Field Day Contest	
Jan 19	HA DX CW Contest	
Jan 24-26	CQ WW 160 m DX Contest	
Jan 25-26	UBA (Belgium) SSB DX Contest	
Jan 25-26	REF (France) CW DX Contest	
Feb 1-2	YU DX Contest	
Feb 8-9	PACC CW/SSB DX Contest	
Feb 15-16	ARRL DX CW Contest	
Feb 22-23	CQ 160 Metre SSB Contest	
Feb 22-23	RSGB 7 MHz CW Contest	
Feb 22-23	UBA (Belgium) CW DX Contest	
Feb 22-23	REF (France) SSB DX Contest	
Feb 23	High Speed CW Contest	

The results of the 1996 Remembrance Day Contest have just arrived from Alek VK6APK, and congratulations to VK7 for a great win in this year's event! This month we also have the results of the recent South Pacific 160 m Contest, and the rules of the Ross Hull and VHF/UHF Field Day contests, so there's plenty to read in this month's column.

Many thanks to those who have been sending information to me on disk or via e-mail. It really does make things easier (and a lot quicker), when one does not have to key in hundreds, or thousands, of figures. I often wonder how we managed before computers arrived, but then I suppose we had typists to do the tedious stuff. How times change!

Speaking of changing times, amateur radio continues to increase in prominence on the World Wide Web. A new home grown site is www.uq.edu.au/radiosport/, packed with useful information about contesting, including a comprehensive calendar, rules, hints, related links, and even a sound file which can be downloaded and played through your PC, to hear what a CW contest sounds like from a top-line contest station, at the height of a run of QSOs! The site is the work of prominent contestor John VK4EMM and software expert Peter VK4TPW, and we are indeed fortunate that he is willing to share some of his secrets with the rest of us. Thank you John.

One hears a lot of gloom and doom about the Web drawing people away from amateur radio, and I must confess my on-air time has been partially reduced for that reason. However, having been on the Web for about six months now, the "gee-whizz" factor has largely worn off, and I'm beginning to feel a lot more optimistic about the future of amateur radio. Sure, one can easily lose a lot of time just browsing around; however, I'm finding that the Web is also a very useful tool, which can materially assist our on-air activities, and make the hobby more enjoyable.

For example, as well as many informative Web pages such as the one mentioned above, there are many good discussion groups as well, covering every aspect of our hobby from DXing, to contesting, to RF design. Once you subscribe to some of these groups, you get all sorts of interesting e-mail, and the opportunity to contribute to the group as well. As amateurs, we are already used to communicating, so the Web is almost like another band. I'm finding my personal motivation for amateur

activities is increasing, thanks to the Web, not diminishing. And the ability to send and receive e-mail is wonderful, you wonder how you previously survived without it!

One thing I have learned relates to e-mail identifiers. Initially, I signed up with an Internet Service Provider (ISP) as vk3apn, but later changed it to pnesbit when I changed ISPs. In hindsight, that was a mistake! Unless you're certain that you will never use the Web for radio or electronics purposes, I'd strongly suggest you use your callsign. It's something to be proud of (and you will be proud of it), it's unique, you'll be instantly recognised by other amateurs on the Web, and it's raising the profile of our hobby. It also makes you much easier to find if another amateur wants to get in touch but doesn't know your e-mail address. Many are the times when I've wanted to e-mail somebody, but couldn't because they didn't use their callsign. The use of callsigns as e-mail identifiers is commonplace in both the US and Europe.

That's all for now. For news, information, tips, gossip, etc, many thanks to VK3KWA, VK4EMM, VK6APK, ZL1AAS, HA5JJ, OE4BKU, QST, and CQ. Have a very happy Christmas, and I look forward to seeing you all in the New Year.

73s, Peter VK3APN

ARRL RTTY Roundup

4-5 Jan, 1800z Sat to 2400z Sun

This contest takes place on the first full weekend of January each year. The object is to contact as many local and overseas stations as possible on Baudot RTTY, ASCII, AMTOR, and packet (attended). More than one digital mode may be used, but QSOs and multipliers are counted once only regardless of mode. The bands allowed are 3.5 - 30 MHz, on frequencies recommended for digital operation (no 10, 18 or 24 MHz). Categories are: single operator multiband (1) max 150 W O/P, (2) more than 150 W O/P; multi-operator single transmitter multiband. A maximum of 24 hours operating time is permitted. At least two separate rest periods must be taken, with the on and off times clearly marked in the log. Listening time counts

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as operating time "Ten minute" rule applies to multi ops.

Exchange signal report and QSO number. W/V/E stations will send signal report and state/province. Score one point per QSO. A station may be worked once per band for points credit. The multiplier is the total US states, Canadian provinces, and DXCC countries worked. The US and Canada do not count as countries. Multipliers are counted once overall, not once per band. The final score is the total points times the multiplier. Check sheets are required for logs with 200+ QSOs. Mail your log and summary sheet within 30 days to: ARRL RITY Roundup, 225 Main Street, Newington, CT, USA 06111. Alternatively, logs can be sent on DOS disk, or to the ARRL RBS (203-665-0090), or via Internet to contest@arrl.org.

Japan DX CW Contest (High Band)

10-12 Jan. 2300Z Fri to 2300Z Sun

The object of this contest is to contact as many Japanese stations as possible on 1.8, 3.5 and 7 MHz CW. Classes include single operator (single and multi-hand), single operator QRP (5 W max O/P), and multioperator (one Tx). Max operating period for single operator stations is 30 hours (show rest breaks clearly in log); multioperator stations full 48 hours. Multi-op stations must remain on a band for 10 minutes minimum.

Send RST plus CQ zone number, JA's will send RST plus prefecture number (01 - 50). Score one point per JA QSO on 14 and 21 MHz, and two points on 28 MHz. Points are doubled for QSOs with QRP stations (QRP stations must send QRP). The multiplier equals JA prefectures + Ogasawara Isl (JDI) + Minami-Torishima Isl (JDI) + Okino-Torishima Isl. Send log postmarked by 28 Feb to: Five-Nine Magazine, Box 59, Kanata, Tokyo 144, Japan.

HA DX CW Contest

Sunday, 19 January, 0900Z to 2400Z

This popular CW contest takes place on the Sunday of the third full weekend of January each year. Categories are single operator single or multi-hand, multi-operator single or multi-transmitter, and SWL. Bands are 160 - 10 m. Exchange RST + serial number, HA/HG stations will add a two letter county code, unless they are HADXC members in which case they will give their club membership number. Codes for each call area are: (1) GY, VA, ZA, (2) KO, VE, (3) BA, SO, TO, (4) FE, (5) BP, (6) HE, NO, (7) PE, SZ, (8) HL, BN, CS, (9) BO, (0) HA, SA.

Score six points per HA/HG QSO, and three points for each non-HA QSO outside your own continent. Multipliers are the total HA counties plus the number of HADXC members worked per band. Final score equals total points x multiplier. Separate logs for each band are requested. Send logs with summary sheet and declaration within six weeks to: Hungarian Radioamateur Society, B-846, Budapest H-1581, Hungary.

CQ Worldwide 160 Metre DX Contest

CW 24-26 Jan. 2200Z Fri to 1600Z Sun

Phone 21-23 Feb. 2200Z Fri to 1600Z Sun

The CW and Phone sections of this contest are

scheduled for the last full weekend of January and February each year. The object is to contact as many stations worldwide on 160 m as possible. VK to VK contacts are permitted for contest credit. Categories are single and multioperator. The use of packet, a spotting net, or logging assistant makes you multi-op. Suggested DX frequencies are 1830-1835, W/V/E's will usually operate outside this window. Look for Japan on 1907-1912.

Exchange RS(T) plus prefix or country abbreviation (VK). W/V/E will send RST plus state/province. Score two points for contacts with stations in own country, five points with stations in other countries in the same continent (continental boundary as for WAC), five points for contacts with /MM stations, and ten points with stations in other WAC continents.

Multipliers are US states (max 48), Canadian provinces (max 13), and DXCC and WAE countries. Maritime mobile stations no longer count as multipliers. The final score equals the total QSO points times total multiplier (US states + VE provinces + DX countries). Indicate CW or SSB on the envelope, and mail the log and paper summary sheet to: 160 Metre Contest Director, David Thompson K4JRB, 4166 Mill Stone Court, Norcross, GA 30092, USA. Mailing deadlines are 28 Feb for CW, and 31 March for SSB.

UBA HB/CW HF Contest

SSB 25-26 Jan, 1300Z Sat to 1300Z Sun

CW 22-23 Feb, 1300Z Sat to 1300Z Sun

This contest runs on the last full weekend of January and February each year (SSB and CW respectively). Any station may work any other worldwide. Categories are: single operator (single & all band); multioperator single transmitter; QRP max 10 W O/P; SWL. Frequencies: CW 3500-3560, 7000-7035, 14000-14060, 21000-21060 and 28000-28060 kHz; SSB 3600-3650, 3700-3800, 7040-7100, 14125-14300, 21175-21350 and 28400-28700 kHz.

Exchange RS(T) plus serial number. Belgian stations will add their province code. Score 10 points for contacts with Belgian stations, three points with other European stations, and one point with others. The multiplier is the total of Belgian provinces, Belgian prefixes, and European countries. Total score is QSO points times multiplier. Send log, summary sheet, declaration, etc. within 30 days to: UBA HF Contest, Oude Gendarmenstraat 62, B-2220 Heist Op Den Berg, Belgium. Logs on disk in K1EA or ASCII format also welcome.

Russ Hall Memorial VHF-UHF Contest 1996-1997

Presented by John Martin VK3KWA

The summer DX season is about to start and here again is your chance to join in a friendly contest and see what your station is capable of achieving. The aim of the contest is to get more stations on the air working DX, and everyone is welcome. You can give out contest numbers even if you do not intend to submit a log. If you do not wish to give out numbers, no one will pressure you. The contest runs for a full month, and the dates are easy to remember: Boxing Day to Australia Day. Plenty of time to enjoy the activity

work some DX and make new friends.

After the last contest I received three proposals for extensive changes to the rules. The suggestions were radically different, and adopting any one of them would have made it impossible to incorporate any ideas from the others. So I compromised by making virtually no changes this year! However, I invite all entrants to include any suggestions in their logs next time round.

Last year's rule on the use of calling frequencies drew some criticism. It cannot be dropped because it is essential to have a chance of hearing weak signals on the frequency where they are most likely to appear. This year the wording has been changed to make the intention clearer.

Last year the 50 MHz scoring was changed in order to reduce the scoring potential of sporadic E contacts. It did not work as expected, so the rule has now reverted to be much the same as in previous years.

Rules

Overview

The WIA maintains a perpetual trophy in honour of the late Ross Hall and his pioneering achievements in the VHF-LHF field, especially the discovery and investigation of VHF tropospheric propagation. The name of each year's contest winner is engraved on the trophy, and he/she will receive an attractive wall plaque and certificate. Other certificates may also be awarded to top scorers in the various divisions of the contest. The contest is not confined to WIA members.

Duration:

0000 UTC Thursday, 26 December 1996 to 2359 UTC Saturday, 26 January 1997. In Eastern Summer Time, this is 11:00 am on Thursday, 26 December to 10:59 am on Sunday, 27 January.

Sections:

(a) Multiband, (b) Single band. All entrants will be scored for both Sections (a) and (b).

General Rules:

All bands above 30 MHz may be used. Single operator only. One contact per station per band per UTC day. Crossband, repeater and satellite contacts are not permitted. Entrants may operate from any location. Entrants must avoid making contest exchanges on recognised DX calling frequencies unless signal strengths or conditions make it impractical to change frequency. On 50 MHz, no contest activity should occur below 50.150 MHz. A frequency of 150 on each band is recommended as a contest calling frequency. All rulings of the Contest Manager on this subject will be accepted as final.

Contest Exchange:

RS or RST numbers plus a three-digit serial number.

Scoring:

Scores will be based on the best 100 contacts on each band, as nominated by the entrant. Each contact will score one point per 100 km or part thereof (ie up to 99 km one point, 100 - 199 km two points, etc). On six metres only, as above, but with a maximum score of 12 points per contact.

The band multipliers are:

6 m	2 m	70 cm	23 cm	13 cm	Higher
x1	x4	x7	x10	x13	x16

Logs:

Logs should cover the full contest period. The

contacts nominated for scoring purposes must be clearly marked in the log, or listed in separate log extract sheets. Logs should have a separate score column for each band, or the logs for each band should be separate

Logs must contain the following for each contact:

- Date and UTC time,
- Station location (if operating portable),
- Callsign of station worked,
- Operating frequency,
- Location or Maidenhead locator of station worked (if not QTHR),
- Reports and serial numbers sent and received, and
- Estimated distance worked and points claimed.

The Contest Manager reserves the right to make corrections to estimations of distance.

Cover Sheet:

- Logs must include a cover sheet containing:
 - Operator's callsign, name and address,
 - Station location (if different from the postal address);

- A scoring table set out as the example below, and

- A signed declaration that the station has been operated in accordance with the rules and spirit of the contest, and that the contest manager's ruling will be accepted as final.

Deadline:

Logs must be received by Monday, 24 February 1997. Early logs would be appreciated. Post logs to: WIA Ross Hull Contest Manager, PO Box 2175, Caulfield Junction, Victoria 3161.

Penalties and Disqualification:

No penalties will apply in cases of errors in calculations or transcription. Scoring penalties will apply if logs are incomplete or illegible. Local or "easy" contacts made on recognised DX calling frequencies will be disallowed.

Awards:

The overall winner will be the top scorer in Section (A). Awards will also be made to the top scorers on each of the following bands: six metres, two metres, 70 cm; 23 cm; 13 cm; and microwaves (bands above 3 GHz).

Sample Scoring Table:

Band	6 m	2 m	70 cm	etc
"100 best" score	XXXX	XXXX	XXXX	XXXX
Band Multiplier	x 1	x 4	x 7	x x
Total	XXXXX + XXXXX + XXXXX + XXXXX			= XXXXX (Grand Total)

Note on Calculating Distances:

Absolute accuracy is not needed. All you need to know is whether the distance is above or below the nearest multiple of 100 km. One method is to use a compass to draw 100 km circles around your location on a map, although better estimates can be made from six-digit Maidenhead locators, where available.

1997 VHF-UHF Field Day

Presented by John Martin, VK3KWA

The annual VHF/UHF Field Day will be run on the weekend of 11/12 January, 1996. This overlaps the Ross Hull Contest, and any contacts made for one can be counted for the other. Please

remember that the Field Day exchange must include your Maidenhead locator, and that repeat contacts are allowed for the Field Day but not the Ross Hull Contest.

There have been several changes as a result of comments received about last year's Field Day. One is to drop the scoring distinction between home and portable stations, which serves no purpose and just makes scoring more complicated. The change made last year to the scoring formula did not achieve its purpose, so a different approach has been taken this year.

The six metre band has been dropped. This will eliminate the QRM problems experienced in the past on and around 50.110 MHz, and will allow portable stations to concentrate on the higher bands with smaller antennas.

The rules have also been changed to provide incentives for stations activating rare grid squares, and "rover stations" operating from more than one square. Provision has also been made for small "team stations" using shared equipment.

Finally, the rule relating to misuse of calling frequencies has been rewritten again, in an attempt to eliminate the interference problems that have occurred in the past.

Duration:

VK6 only: 0300 UTC Saturday, 11 January to 0700 UTC Sunday, 12 January. All other call areas: 0000 UTC Saturday to 0400 UTC Sunday (Note: The three hour time difference is based on the average difference in local time between Eastern and Western Australia, not absolute or sidereal time.)

Sections:

Entrants may submit logs for one of the following sections:

- A: Portable station, single operator, 24 hours
- B: Portable station, single operator, 6 hours
- C: Portable station, multiple operator, 24 hours
- D: Home station, 24 hours.

General Rules:

All modes and bands above 144 MHz may be used. Repeater, satellite and crossband contacts are not allowed. Contacts between home stations are not allowed.

Operation may be from any location, or from more than one location. Operation must be for any six or 24 consecutive hours. You may work stations within your own local square.

A station is portable only if its equipment, including antennas, is transported to a location other than the normal home location(s) of its operator(s). Each station must use only one callsign, and each operator may operate only one station.

If two operators set up a station using shared equipment, they may enter as a multi-operator station or as separate single operator stations.

Help stamp out stolen equipment - keep a record of all your equipment serial numbers in a safe place

Stations with more than two operators must enter section C.

Persistent use of recognised DX calling frequencies for contest exchanges or hazon will result in disqualification. A frequency of 150 on each band is recommended for contest calling.

Contest Exchange:

RS or RST reports, plus a three-digit serial number, plus your Maidenhead locator.

Repeat Contacts:

Stations may be worked again on each band after three hours. If a station is dismantled and moved to a new locator square, repeat contacts can be made immediately. If the station moves back into a previous locator square, the three hour limit still applies to stations worked from that square.

Scoring:

For each band, score 20 points for each square from which your station operates, plus 10 points for each locator square worked, plus one point per contact. Multiply the total by the band multiplier as follows:

2 m	70 cm	23 cm	13 cm	Higher
x4	x7	x10	x13	x16

Then, add up the scores for all bands, to get the final score.

Logs:

Record the following for each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed.

The front sheet should contain names and callsigns of all operators; the postal address which applies to the callsign used; station location and Maidenhead locator; section entered; the period of operation to be scored; a scoring table; and a signed declaration that the Contest Manager's decision will be accepted as final.

Post your log to the VHF-UHF Field Day Contest Manager, PO Box 2175, Caulfield Junction, Vic 3161. Logs must be received by Monday, 10 February 1997. Early logs would be appreciated.

Awards:

The overall winner will be the highest all-band scorer in Section A. Awards will also be made to the highest scorer on each band in Section A, and the highest scorers in Sections B, C and D.

Results of the 1st South Pacific 160 m Contest

Presented by John Litten, ZL1AAS

This event, held last July, proved to be very popular on both sides of the Tasman Sea. On phone, some 76 different callsigns were logged, while on CW, 68 callsigns were noted. DX was also represented from ZK1 in the East, to VQ9 in the West, and also included many North American stations. For some entrants this was their first attempt at contesting, so welcome to our ranks!

Some of the comments received:

My first solo contest, enjoyed it very much. Every operator was friendly and patient. VK4WJT, 160 is very under utilised over here, and contests such as this can only help newcomers appreciate what a great band they have been missing out on... VK6ABL, Good fun, plenty of activity, but only a few DX stations on CW. It should be even better next year! VK3JO, Thank you, lots of fun, many congratulations! We look

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FT-840 Economical HF Mobile Transceiver

A serious HF transceiver that won't break the bank, yet doesn't compromise performance at home like many current micro-rigs. The Yaesu FT-840 gives you full 160m-10m Amateur band coverage with 100W PEP output on SSB/CW/AM, continuous receiver coverage (100kHz-30MHz), 100 memory channels, a large back-lit LCD screen, an effective noise blanker and an uncluttered front panel. The FT-840 is simple to use, with useful features like an SSB speech processor for added audio punch, IF Shift to fight interference and Direct Digital Synthesis oscillators for cleaner transmit and improved receiver performance. Includes DC power lead and hand microphone. Just connect your power supply and antenna, and start having fun.

D 3275

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BONUS

FM Module (D-2932)
VALUED AT \$99.95



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FT-900 Deluxe HF Mobile Transceiver

The FT-900 is a no compromise 100w HF transceiver ideal for vehicle, shack, or DXpedition operation. Its superb front-end performance really shines through, with a quad FET mixer to prevent overload and a Collins SSB mechanical filter for the excellent selectivity needed with improving HF band conditions.

For mobile convenience the FT 900's lightweight front sub-panel can be remote mounted using an inexpensive kit, without compromising transmit audio quality like some competing models. An optional auto antenna tuner can also be installed internally and operated from the front panel. At home, the frequency/band keypad SSB speech processor with IF Shift audio tailoring, VOX, CW keyer, 29MHz FM repeater access tones, and general coverage 100kHz to 30MHz receiver will certainly add to your operating enjoyment.

D-3280

\$1995

BONUS

Half-price ATU-2 auto antenna
tuner when purchased with your
FT-900. SAVE \$249

FT-1000MP Deluxe HF base transceiver

Our very best 100w HF transceiver, the FT-1000MP combines proven RF design with exclusive IF based Enhanced Digital Signal Processing (EDSP) to provide a stunning new level of HF base station performance. Yaesu's exclusive EDSP facilities provide impressive IF based noise reduction and interference rejection filters for enhanced receive operation, as well as flexible transmitter tailoring for outstanding signal clarity. New features include selectable receiver front ends, 3 antenna connectors, tuning steps from 0.625Hz, a Shuttle-log tuning system, and a comprehensive menu system so you can select the best transceiver settings for your operating conditions. With so many features included you'll really need to see a copy of Yaesu's 12 page colour booklet to appreciate how an FT 1000MP could really revolutionise your HF operations.

D 3400

\$4495

BONUS

FT-1000 2m 5W
Handheld Transceiver (D-3650)
VALUED AT \$455



2 YEAR WARRANTY

2m 30W RF Power Amplifier

Boost your 2m FM handheld's output with this compact power amplifier. Provides up to 30W output with just 3W input, and over 15W output for just 1W input. Includes receive pre-amp for quiet RF areas. Cat D-2515



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Quality Revex wide-band SWR meter, offering 2 in-built sensors for 1 8MHz to 525MHz coverage! Provides measurement of 3 power levels (3W, 20W, 200W), and SWR. Uses an N-type socket for the VHF/UHF sensor to ensure minimal loss. Measures 120 x 80 x 85mm. Cat D-1375



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49 tunable memories, large variety of scanning modes, instant recall CALL channel, 7 user-selectable channel steps (5kHz to 50kHz), Back-lit LCD screen and knobs, 38 tone CTCSS encoder, DTMF based paging & selective calling with Auto-Page/Forwarding features, 10 DTMF auto-dial memories, supplied with microphone, mounting bracket & DC power lead

Cat D-3635

2 YEAR WARRANTY

\$599

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FT-736R VHF/UHF Base Station Transceiver

Whether your interest is in talking through your local repeater, operating SSB DX, or talking to the world via satellite, this high-performance multimode base station transceiver can do it all! In its standard form, the FT-736R provides 25W output on the 2m (144-148MHz) & 70cm (430 450MHz) bands in SSB, CW, and FM modes. Can be expanded to cover the 6m (50-54MHz) & 23cm (1240-1300MHz) bands by installing optional modules.

Features:

- Digital control with keypad frequency entry
- 10 full-duplex crossband memories, 2 independent VFOs per band, 100 general-purpose memories
- 2 full-duplex VFOs - transmit & receive frequencies (and modes) can be tuned independently or synchronously for satellite operation
- Adjustable IF Notch and IF Shift filters
- Noise blanker, 3-speed selectable AGC
- High-stability (+/-1 ppm) PLL reference oscillators
- Speech processor and VOX for SSB
- VFO or selectable channel steps on FM
- Digital input connection for packet TNCs
- Efficient switch-mode AC power supply

Cat D-2920



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B 2632

forward to next year very much. **ZL2JR**. Conditions were very quiet, although no VK6, VK7 or VK8 were heard. **ZL3TX** Made more 160 m QSOs than in the whole of my life! Will try to stay up all night next time. **ZL4OK/1** I found the Windom good on receive, but it was hard to make contacts across the pond. Apart from that I enjoyed the contest. **ZL4AV** I really welcome the idea of a 160 m contest. Conditions deteriorated as the night progressed, with noise over S9 by 0900 UTC. The band was in good shape earlier, although there weren't many early starters... **VK1DT**. Nice to work so many VKs well past my sunrise at 1300 UTC! Looking forward to more activity next year... **AJ6T**, ex **ZL0AJA**.

Yes, the contest will be run again next year, on the third full weekend of July. For 1997, this will be Saturday, 19th July. I hope to see you all then, and also that many more of those who took part will next time take the trouble to send in a log. **Phone:**

(QSOs/Points/Multiplier/Score/Antenna)					
VK1DT *	16	77	5	385	3/4 Loop
VK3JO *	24	93	9	837	Dipole
VK3APN	12	51	5	255	Vertical
VK3XB	3	12	3	36	Vertical
VK3DYF	2	7	2	14	Dipole
VK4EMM *	31	119	8	952	Vertical
VK4WJT	20	94	9	846	Inverted V
VK5CRS *	51	240	13	3120	Rhombic
ZL1BRV *	23	103	7	721	Dipole
ZL4OK/1	19	86	7	602	Inverted L
ZL1ALZ	13	59	6	354	
ZL2JR *	40	179	13	2327	3/4 Sloper
ZL2AWH	20	79	8	632	
ZL3TX *	23	109	8	872	Vertical
ZL4PZ *	24	111	8	888	Dipole
ZL4AV	7	32	4	128	Windom
CW:					

CW:					
VK3APN *	31	134	12	1608	Vertical
VK3DXI	16	74	8	592	1/4 Sloper
VK3JO	18	69	8	552	Dipole
VK3XB	12	42	6	252	Vertical
VK3KS	8	25	4	100	Vertical
VK3DID	8	19	2	38	40 m Dipole
VK4EMM *	35	160	12	1920	Vertical
VK5LU *	6	30	4	120	
VK6ABL *	16	80	8	640	3/8 Inverted L
VK8AV *	8	40	6	240	1/4 Sloper
ZL4OK/1 *	20	91	9	819	Inverted L
ZL1ALZ	15	66	8	528	
ZL2JR *	44	211	12	2532	3/4 Sloper
ZL4PZ *	13	65	7	455	Dipole
AJ6T *	5	25	3	75	Inverted L

(ex ZL0AJA)

Check Log: ZL3DK/2 (thank you)

1996 Remembrance Day Contest

Tasmania Triumphal!

Presented by Alek Petkovic, VK6APK

Congratulations to VK7 Division for a tremendous effort in winning the 1996 RD contest. A consistent score on HF and a big push on VHF has resulted in the Tasmanians being premiers for this year. Well done to everyone who participated and made this win possible.

VK4, who were very unlucky to be beaten last year, had it done to them again this year. Right from the very first week of the logs being

received, my money was on VK4. With the number of logs received from that division, it seemed that they would be very easy winners. I guess it shows that the contest is not over until the last point has been counted.

Why is VHF activity confined only to the capital cities? Many regional towns have large numbers of amateurs (more than two) who could make a substantial difference to their division's score, if they would just turn their 2 m radios on. Remember that all VHF contacts are virtual double points for your Division, so why not give VHF a go next year?

On the whole, I think that the level of activity was very good, considering the state of the bands at this stage of the solar cycle. It is a great shame that we can't get a higher percentage of participants' logs submitted. Looking through the logs shows that there are large numbers of people who take part on the day, but then don't submit their logs. Some of them had very large scores as well.

Divisional Scores:

Let's now look at the figures for the 1996 RD Contest. The rules explain how the winning Division is determined, based on a set of improvement factors. The procedure is easily understood.

First, we establish the HF and VHF benchmarks for each Division, against which their performance for the current year is judged. The same formula is used for HF and VHF, inserting the HF or VHF figures as appropriate: $B = 0.25 P + 0.75 L$, where B = this year's benchmark, P = last year's total points, and L = last year's benchmark.

Next, we calculate the improvement factors for HF and VHF, for each Division. Once again, the same formula is used for HF and VHF, inserting the HF or VHF figures as appropriate: $I/F = \text{Total Pts (this year)} / \text{Benchmark}$. Finally, the HF and VHF improvement factors for each Division are averaged: Overall I/F = (I/F (HF) + I/F (VHF)) divided by two.

After sorting the results, we get the Divisional Ladder:

Table 1: Divisional Ladder

1st	VK7	6.868
2nd	VK4	2.278
3rd	VK5/8	1.171
4th	VK1	1.132
5th	VK2	0.722
6th	VK6	0.587
7th	VK3	0.462

For those wishing to verify the calculations, Table 2 shows all the figures (P and L were obtained from the published results for last year's contest).

Table 2: Divisional Scores

WIA Div'n	HF					VHF					Avg I/F
	P	L	B	Pts	I/F	P	L	B	Pts	I/F	
VK1	2239	212	718.8	1097	1.526	583	176	277.8	205	0.738	1.132
VK2	4619	3803	4007.0	5367	1.339	134	82	95.0	10	0.105	0.722
VK3	6911	4031	4751.0	3397	0.715	9238	16364	14582.5	3034	0.208	0.462
VK4	5471	1908	2798.8	4736	1.692	2330	307	812.8	2328	2.864	2.278
VK5/8	4384	2884	3259.0	5206	1.597	1881	1298	1443.8	1076	0.745	1.171
VK6	3409	3115	3188.5	2272	0.713	4740	9323	8177.3	3779	0.462	0.587
VK7	2238	1724	1852.5	2151	1.161	153	14	48.8	613	12.574	6.868

The "Pts" and "B" figures from Table 2 will become the "P" and "L" figures for next year's contest, respectively. Using the above formula for B, we can already work out the benchmarks for next year's contest, which are shown in Table 3. These are the total scores which must be obtained, by each Division, to achieve an improvement factor of one in next year's contest. They will be reprinted with next year's rules. It will, of course, be in the interests of Divisions to try and exceed the following scores.

Table 3: 1997 Benchmarks

Div'n	HF	VHF
VK1	813	260
VK2	4347	74
VK3	4413	11695
VK4	3283	1181
VK5/8	3746	1352
VK6	2959	7078
VK7	1927	190

Individual Scores:

The individual scores for entrants are listed below. The standard of logs was very high, and few corrections were needed. The CW scoring still had some people confused, and quite a few others were still combining their HF and VHF logs, which made the task of working out the respective scores rather difficult. A handful of operators submitted only a cover sheet. I have accepted these and included them in this year's scores, but they will not be included in the future. Only complete logs with a summary sheet will be accepted from now on. Despite these minor gripes, the job of collating the scores and receiving your comments has once again been a pleasure for me. Certificate winners are denoted by an asterisk (*), and the top Australian scores in each section by a hash (#).

VK1	HF Phone	VK2	HF Phone
PJ *	445	XN *	444
MJ	255	DCL	345
AJM	77	PB	318
SW	52	XT	296
KMA	13	XH	288
HF CW		CAA	286
FF *	146	CM	273
HF Open		DM	212
PK *	109	HV	203
VHF Phone		AGF	125
DO *	92	EJC	107
ZQR	36	ALZ	89
MJ	28	ANK	77
KMA	16	LMA	73
VHF CW		WF	61
ACA #	20	LEE	39
VHF Open		IV	29
FF *	13	NW	16

CF	15	KBD	123	VHF Phone		AFO	28	VK7		EB	16
HF CW		CAM	120	KMA *	117	ZKK	24	HF Phone		RM	10
ZC *	262	FT	117	QH	144	VK6		OTC *	344	VHF Phone	
BHO	212	XJU	110	LP	134	HF Phone		RN	276	HDM *	119
PS	172	DUQ	103	YAR	96	SZ *	428	KZ	193	HIL	108
GS	170	ER	102	ZA	70	DA	229	SHV	193	OTC	108
CW	136	CRP	101	NEF	59	CSW	138	CK	188	JGD	71
AIC	130	WWV	101	EWR	58	JP	100	OH	187	EB	62
RJ	104	KK	70	IF	55	RG	87	KC	177	JK/P	50
EL	93	KTO	68	PCB	55	WJH	67	NDO	139	NDO	35
DID	27	SM	63	YEA	55	AV	59	KV	119	KSM	27
AZR	20	MGZ	42	PT	53	VZ	57	PC	118	RM	15
HF Open		DYL	33	BV	48	KH	41	JP	70	KZ	10
BO *	501	DID	26	PJ	36	APK	28	NGC	55	RN	2
VM	244	FR	23	UJ	28	KG	26	JGD	41	VHF Open	
VHF Phone		AWS	21	ADY	23	YF	22	LS	25	SHV	6
TJO *	10	XH	21	KZR	21	NTJ	21				
VK3		AGH	20	BB	16	PX	20				
HF Phone		AL	16	WAY	11	HU	18				
BML *	252	AHY	11	BBS	10	SAN	17				
AHY	243	LCM	8	KD	5	WZ	11				
JK	156	VK4		VHF Open		HK	10				
CX	140	HF Phone		AR	# 458	HF CW					
ADW	105	BB *	290	2FZ/4	371	AFW *	184				
FT	101	EJ	281	IC	121	AF	70				
SM	100	BAY	228	GWC	64	AJ	56				
EX	92	PJK	208	VK5/8		HF Open					
CAM	77	BTW	105	HF Phone		GW *	301				
LCM	72	KEL	79	CRS	# 614	BIK	103				
HG	66	EII	76	CA	475	RU	82				
MSL	58	QF	65	8DK	322	WT	60				
PDX	53	PT	64	BWH	243	RZ	37				
ABP	50	EWR	61	BUM	214	VHF Phone					
MID	50	ACW	58	GRC	137	KTN *	328				
KTO	48	DO	58	KGB	115	ZDW	298				
ALD	44	IC	54	MH	114	HU	211				
MGZ	37	SCC/4	46	RV	103	SAN	210				
KH	36	SJ	45	UE	87	ANC	158				
SZ	34	PJ	39	8KTC	58	RG	156				
DY	30	GZ	38	BVJ	55	AR	152				
GAT	30	BX	33	CTY	44	TKR	129				
NV	30	YG	32	RK	40	FJA	128				
BF	29	EHT	32	ZQ	40	JP	116				
DYF	20	ADY	31	SE	37	WIA	110				
IWD/3	17	IL	30	LL	30	RRG	106				
BCZ	15	KD	30	AKQ	27	MIN	100				
AAJ	11	PJK	30	TY	25	UV	100				
CRP	11	BSH	25	KJT	22	ZPP	96				
HF CW		WJG	25	HO	16	YF	83				
FCR *	240	LAA	23	NP	14	SM	74				
APN	218	RM	14	HF CW		LZ	71				
DID	108	WAY	12	BGL *	128	ZLZ	71				
XB	108	IF	11	XE	112	APK	66				
DVW	102	NEF	11	AFO	92	ZIC	66				
AMD	72	BBS	10	BS	68	AHR	58				
FG	66	XZ	10	HF Open		WT	54				
KS	60	HF CW		BRC #	659	CSW	51				
DNG	58	XA #	364	RAV	490	TS	50				
HF Open		XW	200	ATU	368	RO	44				
ALZ *	217	RE	64	GZ	310	RK	34				
IO	115	XY	36	WO	147	HZ	30				
ANP	26	HF Open		VHF Phone		KG	26				
VHF Phone		EMM *	626	BRC *	320	DY	24				
EO #	422	LT	416	THA	196	BW	22				
AYF	283	FW	297	ZBK	126	WZ	17				
BF	226	PCB	246	GRC	125	GA	16				
GAT	224	UW	130	BW	110	RU	12				
DLE	220	ZA	100	NCA	66	VHF Open					
TBM	185	OD	71	RV	47	CX *	366				
JK	175	AJH	32	TMI	34	AD	146				

Overseas entries were down in number from last year, and I believe this is due to the fact that the contest was not publicised in *Break In* and *Radio and Communications* magazines. This was my responsibility and I shall make every effort to ensure that this won't be repeated next year. Despite this, I did hear a fair bit of activity from P29 and ZL, with the two leading ZLs giving many VKs a run for their money, in the respective sections.

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2LR * 101

It was pleasing to see some SWL logs this year. I hope that we may see an increase in this area in future years, along with better recognition for the efforts of those who take part in this side of the contest. The three entries received are listed below.

SWL HF
 Ian McGovern (VK2) * 352
 Peter Kenyon (VK6) 315
 VK2TJO (VK2) 89

That's it for another year. I hope you enjoyed the contest, wish you a merry Christmas and a happy and successful 1997, and will close with some of your comments on this year's RD contest.

"Good to take part in another RD contest — Seems to me that numbers were down on previous years" **ZL1BVK** "Heard no one on 15 m or 10 m" **ZL3TX** "Not a lot of activity but all stations worked had good readable signals" **ZL1ALZ** "Very lean pickings this year" **ZL2LR** "Great to catch up to the regulars — It's a pity non-contestants don't respect that there are those who use 'another mode' of amateur radio" **VK1PJ** "A good contest — Especially with the 10 m opening. Also a chance to try out new QRP equipment" **VK1PK** "I strongly believe that it is time to acknowledge the changing pattern of our lives and aim to concentrate the RD contest as an eight hour only contest" **VK1DO** "VK7RN Ron deserves an award for being by far the best operator in the whole contest. He continually gave out very friendly reports and brightened up a sometimes very dull band!" **Ian McGovern SWL** "Although condx were patchy, what I heard of the contest was in good spirit!" **VK2IV** "Both 10 m and 15 m were pretty poor at my location and contacts had to be worked for" **VK2ZC** "Not many CW stations this year" **VK2AZR** "My second RD contest. Great fun!" **VK3FCR** "Always try to be in both the RD and the VKZL, on CW not phone" **VK3AMD** "Heard P29CPM on 160, but couldn't raise him despite repeated calls" **VK3APN** "Had good fun, plenty of activity, great band conditions, although nothing heard from VK9" **VK3JO** "For the CW contacts my power was five watts". **VK3ANP/QRP** "I was very disappointed that there was no activity on 2 m CW and nothing on SSB" **VK3JD** "Always really enjoyed the contest" **VK4BB** "Once again

a terrific contest but very disappointed with the lack of participation, particularly Novices even though there were good openings on their segments" **VK4EJ** "No need for digital surround sound. All bands were open and conditions generally good for bottom of cycle 22" **VK4BAY** "I was all set to enter this contest until I became the victim of DELIBERATE QRM in the form of a carrier and whistling at 20 over 9 strength" **VK4SJ** "Bands which normally open, didn't — this year it was hopeless" **VK4BSH** "Good conditions on 15 m helped to improve on last year's score" **VK4EMM** "This contest was a disappointment with a lack of operators. Novice CW was non-existent — too much emphasis on VHF/UHF which takes lots of operators off HF" **VK4FW** "Always a lot of fun" **VK4OD** "Amount of operators was less this year than last year" **VK4KMA** "Good openings on 10 and 15

Good to see four P29s on 80 m on Saturday night" **VK5CA** "Great to hear 15 and 10 open up for the occasion and catch up on a lot of calls I haven't heard for a long while". **VK5RV** "I think activity was well down this year especially on VHF. We had our usual good time and enjoyed it immensely". **VK5BRC** "It was a pity that some of the big scoring, high powered rigs did not use CW!" **VK8AV** "My 45th RD contest. Enjoyed it as always. Great to meet up with old amateur radio friends" **VK5WO** "VHF activity down on last year". **VK5KXC** "I enjoy it every year" **VK5THA** "It's a pity that stations that come up for this contest do not do so at other times of the year, particularly for other contests" **VK6ZDW**

73, de Alek

*PO Box 2175, Caulfield Junction, VIC 3175
 presbit@melbpc.org.au

Club Corner

Radio Amateurs Old Timers Club (RAOTC)

A most important item in our monthly broadcast is the Icom model IC-255A FM transceiver located at the QTH of Ken Seddon VK3ACS to receive the 145 700 MHz FM original transmission from myself VK3AMD.

This transceiver was used actively in the amateur radio station VK3AOM in the Science Museum of Victoria in Swanston Street, Melbourne. When this station was closed down about the time the new Scienceworks was building at Spotswood and, sadly, not enough volunteers could be found to recreate VK3AOM, we asked and obtained the loan of the Icom, IC-255A which was booked out care of myself and installed at the QTH of VK3ACS.

As there has not been any enthusiasm for the re-activation of VK3AOM and because members of RAOTC have contributed a lot of material assistance to the Science Museum collection, notably the completely operational Kingsley AR7, the Museum of Victoria has now gifted the transceiver to the RAOTC.

In the letter received from Dr Ian Galloway, Deputy Director, Museum of Victoria, and Director, Research Collections, he says, "I understand that the transceiver is still used once a month as a relax station, and is an important part of the

network which provides a news service to radio amateurs. The Museum of Victoria is pleased to be able to assist your club in this way, and hopes that the transceiver can be of service for many years to come."

A letter of thanks for this valuable help has been sent to Dr Galloway, including appreciation for the help of Ms Ruth Leveson, a Curator at Scienceworks.

Members are reminded that there will not be a broadcast in January.

Allan Dobie VK3AMD
 President
 ar

QSP News

Special Event Station

2 to 12 January 1997 marks the time slot for the 10th Australian and the 3rd Asia Pacific Scout Venture in Adelaide, South Australia.

The special call sign of V1510AV has been allocated to the event and this will be run as an on-site activity in the second half of the event from 8 to 12 January inclusive.

A QSL card will be sent to all stations contacted, so please look for us on 3590, 7030, 14070, 21140 and 28190 kHz between 0030z and 0930z. We are also hoping to run a packet station so, for those enthusiasts, please keep a watchful eye.

Dean Whitehorn
 Project Commissioner
 Scout Association of SA

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Divisional Notes

Forward Bias - VK1 Notes

Peter Parker VK1PK

Canberra Hosts Federal Convention

On the weekend of 26/27 October, VK1 hosted the October WIA Federal Convention. Held at the Forrest Lodge Motor Inn in Barton, representatives of all WIA Divisions and Federal Executive were present. Several VK1 committee members took the opportunity to meet the interstate visitors on the Saturday evening.

The convention made a number of decisions that should improve the way that the Institute is administered. VK1WI listeners were the first to know about them in a live report from our Federal Councillor Richard VK1RJ on the Sunday broadcast, transmitted just a few hours after the convention finished. Also carried that evening was an interview with our Federal President, Neil Penfold VK6NE.

VK1s Enjoy Foxhunt Talk

October's General meeting was one of the best ever for the Division, with there being many attractions to interest members and visitors. The main event was a talk by Rob VK1KRM on foxhunting. Now armed with a little more knowledge, we hope that more people will be participating in this fascinating activity.

Those present who booked to attend last month's VK1 Technical Symposium received a five dollar entry fee discount. And talking of discounts, members were able to buy the 1997 WIA Callbook for two dollars less than the recommended retail price, thanks to an order placed by our Federal Councillor, Richard VK1RJ. Copies of the Callbook may still be available by the time you read this - contact Richard on 258 1228 if you would like a copy.

Information Sheet Released

The VK1 Division is pleased to announce the release of an information sheet on the Division's activities. Produced in early October, the sheet promotes the activities of the Division to existing and prospective amateurs. It contains details on repeaters, packet radio, the broadcast, examinations and classes. Members were shown the sheet at the October General meeting. Look for it next time you visit an electronics store or the SMA Area Office - you will normally find it on the counter. The A5-sized sheet has been printed on coloured paper and has a modern, professional appearance.

We encourage other Divisions to produce similar sheets to promote their activities. The information sheet (as well as a draft copy of the much larger Canberra Amateur Radio Guide) was passed around at October's Federal Convention, as an example of what the WIA can and should do to promote amateur radio.

JOTA '96 Successful

Several stations around Canberra and Queanbeyan took part in this year's Jamboree on the Air, held back in October.

New this year was the use of the new UHF linked repeater system. As well, there was extensive use of the packet radio converse server, established by John VK1JET. The new system of transmitting the JOTA opening broadcast appeared to work well, with signals better than last year.

With more repeaters available, VHF/UHF opening seemed to be more orderly than last year. Those involved in JOTA would like to thank other amateurs for making these frequencies available over the JOTA weekend.

VK1 Committee Meeting

The VK1 Committee met on Monday, 14 October at Mawson Primary School. The following were discussed:-

- * Interference to amateur operation from Galaxy satellite TV set-top boxes - interference was apparent from 2 MHz right through to VHF, with the problem being worst on 21 MHz.

- * A common expiry date for all callsigns held by the Division was arranged. This should make administration easier for all concerned.

- * A trip to Mount Ginnin by Paul VK1BX, Graham VK1KGT and Gilbert VK1IGH is proposed. The main purpose is to document what equipment we have there and so update our assets register.

- * Promoting amateur radio and the VK1 Division, including the completion of the new VK1 Information Sheet.

- * Federal Matters - particularly the need for there to be changes in administration to contain costs in the face of stagnant membership levels. Federal Council discussed these matters in detail a fortnight later at the Canberra Convention

VK2 Notes

Peter Kloppenburg VK2CPK

Due to pressures of work and other commitments, Richard Murnane VK2SKY

is no longer able to continue as editor of this column. On behalf of everyone concerned, we thank Richard for all the time and effort he spent in compiling this column.

It is my intention, initially, to structure this column around the various services that the NSW Division provides to its members. But I will also include details of future events that affect the amateur community in NSW.

Work is in progress to construct a six metre repeater for the WIA Dural facility. The system will consist of a rack mounted unit, three tuned cavities, and a vertically polarised antenna. The heart of the system is a Philips FM-828E (68 - 88 MHz) mobile transceiver modified to operate on a transmit frequency of 53.850 MHz and receive on 52.850 MHz in duplex mode. Output power is 25 watts. December 1996 is the estimated date of operation.

Presently, at Amateur Radio House, tuition is given in theory and Morse for students wishing to sit for the Novice examinations. Early next year, a combined course will be offered that caters for Novice and Unrestricted examinees. The Institute conducts exams for all exam subjects every six weeks. Concurrent with this activity, work is going on to update the study material



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COUNCIL
wishes

All our Members
and our friends in other
Divisions

A
VERY MERRY
CHRISTMAS
and a
Happy & Prosperous
NEW YEAR



that was used in support of the Correspondence Course. This course was successfully run for a number of years until the great upheaval in licensing, examination subjects, and regulations occurred. The plan is to offer the course in the beginning of next year.

It would be useful if anyone who has a copy of "Amateur Radio Operator Theory Handbook" by F Swanston would donate or sell it to the Division, as the book is out of print and no suitable substitute is available.

As most of you know, the service provided by the NSW QSL Bureau is free to members of the Division. Until recently, any non-member radio amateur could use the bureau service by paying an annual fee of \$24. However, this form of part-membership turned out to be a hindrance to the smooth operation of the QSL bureau. Its operators were never sure who had paid their fee and when. As the bureau is only contracted to provide the service and not go into any correspondence, Council decided that only members of the Institute could participate in the QSL bureau service. It is pointed out here, that WIA membership is available at a minimum cost of \$38.75. This is the (X) grade membership which does not entitle you to receive *Amateur Radio* magazine, but does entitle you to all the other privileges of membership.

The Divisional library is seeing some changes as well. The librarian and archivist, Aub Topp VK2AXT, ably assisted by Barry White VK2AAB, are busy updating the stack with new and old editions of books, manuals, magazines and other periodicals. They are using a computer with appropriate software to replace the catalogue presently in use. From now on, visitors can use the computer to find their way around the library just as easily as in the State Library. The library receives much of its contents through donations. Often it receives more than it can handle. As a result, an impressive number of books and magazines, including *CQ*, *QST* and *Amateur Radio*, will be available at the Trash and Treasure sale in November.

Council has received and accepted the resignation of Councillor Anthony (Tony) Lioio. Pressures of work and family commitments didn't leave much time for Tony to attend Council meetings and perform the duties of Broadcast Officer. The position of Broadcast Officer has now been taken over by Richard Mumane VK2SKY. Tony's place on Council has been filled by Brian Kelly VK2WBB, the next person on the voting list at the last Council election.

Council has taken possession of ten high power VHF linear amplifiers model Philips AM17A. Any member who wants to

purchase one should contact the Division in the normal way.

The Division is organising a Christmas Barbecue at the home of Jo Harris VK2KAA. Cost \$12 a head. Date to be decided yet, but likely in second week of December. Listen to the Divisional broadcast for details.

The next meeting of the Conference of Clubs for the Southern Region will be held during February 1997 in Goulburn.

VK3 Notes

Barry Willon VK3XV

Christmas Holidays

The WIA Victoria office will close on 19 December 1996 and re-open on Thursday, 6 February 1997. Membership applications received by post during this period will be processed.

Emergency Contacts

During the Christmas holiday period a recorded telephone message on the WIA Victoria office number 03 9885 9261 will provide emergency contact telephone numbers for various Division Officers and for WICEN.

Sunday Broadcast VK3BW1

The last broadcast for 1996 will be on 1 December and transmissions are scheduled to recommence on 2 February 1997.

The location of the broadcast facility at Lyndhurst is currently under threat, as the property on which it is located has been earmarked for sale by the Victorian Government. WIA Victoria may be able to negotiate with the purchaser, and this matter is currently under review.

A re-transmission of the VK3BW1 broadcast in the evening of the day of the broadcast will be trialled for three months commencing with the first broadcast in the new year. There will not be a callback following this re-transmission.

Nominations for Council

Nominations for the 1997/1998 Victorian Division Council close at noon on Thursday, 27 February 1997. Nominations will only be accepted on forms available from the Secretary.

Nomination forms should be obtained prior to close of business on 19 December 1996, or after the office reopens in the New Year.

Notices of Motion 1997 AGM

Notices of Motion for the 1997 Annual General Meeting close at noon on Thursday, 27 February 1997. Notices of Motion must be signed by three financial members of the Victorian Division.

Voting at Meetings

During the 1997 year it is anticipated members will be invited to attend a number of meetings in addition to the AGM. Meeting notices are required to be forwarded to members at least 21 days prior to any meeting, and in some cases notices may be forwarded at an earlier date. Members who are not financial at the time a meeting notice is posted will be deemed ineligible to vote at the meeting in respect of which notice has been given.

1997 Subscriptions

Owing to the financial loss sustained by the WIA Federal Secretariat in 1996, the Federal Council resolved to increase the Federal Component payable by Divisions in respect of each member by \$2.00. WIA Victoria incurred unforeseen financial expenditure in 1996 due to the high cost of the 1996 council election conducted in accord with the outdated Articles of Association. We will also be required to meet a significant cost increase in respect of repeater licences after 11 November 1996, and the WIA Victoria subscription component will increase by \$1.00. Subscription rates will increase by \$3.00 for all grades of membership.

Articles of Association

Members' comments regarding the draft Memorandum of Articles and Association have been received and will be considered during the next eight weeks. It is anticipated a Special General Meeting will be convened early in the New Year to further deal with this matter. All members will be notified of the scheduled date by mail.

November Council Meeting

A meeting of the WIA Victoria Council on 7 November with nine of the 10 councillors and the Federal Councillor in attendance, again expressed its dissatisfaction with the performance of the Directors of the Federal body in the management of the organisation's financial affairs.

In spite of our repeated requests, a Federal budget for 1997 was not forthcoming and no information was provided regarding the future publication of *Amateur Radio* magazine.

The WIA Victoria Council is concerned that actions and decisions made by the Federal directors are without regard to the wishes or needs of this Division, yet VK3 members are a major provider of funds for the Federal body and have little or no effective control over Federal expenditure.

Proper and prudent management of our own finances has been made exceedingly

difficult and the directors of WIA Victoria would be acting without "due care and diligence" in the performance of their legal duty to the membership if they allow this situation to continue.

Major changes are foreshadowed early in the new year and Victorian members can be assured this Council will do everything possible to preserve the WIA Federation, albeit in a changed form. It will, however, act positively in the interest of the membership to ensure the future stability of our own financial resources.

Christmas Greetings

Council wishes all members a Merry Christmas and a Happy New Year. Thanks to all members who have provided support and encouragement during what has been a difficult year.

VK6 Notes

John R Morgan VK6NT

Divisional GM

The attendance at the October GM was not sufficient to form a quorum. Will VK6U1 displayed the Division's Internet web pages, into which he has invested many tens of hours of effort.

General Meetings are held on the third Tuesday of each month in the Board Room, 2nd Floor, CWA House, 1174 Hay Street, West Perth, commencing at 8 pm. There is no meeting in December. All interested persons (members and non-members, licensed or listener) are invited to attend, and will be plied with free coffee and biscuits.

Hamfest '96

In an effort to foster greater understanding of our hobby, and thereby to help replenish our ranks and so ensure its survival, Perth's major annual Amateur Radio event is organised each year by the Northern Corridor Radio Group Inc (known as the NCRG, club callign VK6ANC), which is affiliated to the VK6 Division of the WIA. This year's event occurred on Sunday, 3 November, and more than 500 paying entrants (at a very reasonable \$2 each, as it was last year) enjoyed the air-conditioned comfort of the Cynl Jackson Community and Recreation Centre, in Ashfield.

This year's Organising Committee decided to involve, for the first time, computer hobbyists and electronics enthusiasts, during the preceding months, advertising leaflets were distributed at local computer swap-meets, and some of the regular participants there were invited to attend. Commercial traders present included Atkins Electronics (part of Atkins Carlyle Ltd), Jaycar Electronics Pty Ltd, Ford

Electronics Pty Ltd, Intelligent Internet Services, and X-On Electronic Services. Once again, Icom Australia Pty Ltd demonstrated its serious commitment to amateur radio, with its managing director and the ever-popular Duncan Baxter VK3LZ meeting many VK6 radio amateurs, and supporting their local authorised dealer, John Tower VK6IM of Tower Communications.

One of the regular features of Hamfest is the "monster" raffle. The first prize was an Icom IC-2000H 2 m FM mobile transceiver (donated by Icom Australia Pty Ltd), won by SWL Chns, of Padbury. The second prize was a Kenwood TH-28A 2 m FM hand-held transceiver (donated by Kenwood Electronics Australia Pty Ltd), which went to Craig VK6PCM. The third prize was a 28.8 k Fax/Modem with six months' membership of the Internet (jointly donated by The Net Effect and Omen Internet Services), which was won by Mel VK6TVA. The fourth prize was a Citizen hand-held LCD colour TV/Radio (donated by Dick Smith Electronics Pty Ltd), won by Bob VK6KRC. The NCRG urges you to support these organisations with your commercial patronage.

Non-commercial regular supporters included the UHF CB Association, WIA Divisional Bookshop, Travellers' Net, Vintage Wireless and Gramophone Club, and VHF Group. This year, the VK6WIA news broadcast was transmitted from the venue by the Division's Broadcast Officer, Tony VK6TS, with assistance from Mel VK6TVA.

Also this year, the "homebrew" competition was well supported, with eight entrants. The first prize was the latest ARRL Handbook, donated by the WIA Bookshop, and was awarded to Neil VK6BHT, from Geraldton, for his 5.7 GHz transceiver. For his power supply, Adrian VK6TCC was awarded the second prize, which was a digital multi-meter donated by Jaycar Pty Ltd. The third prize was awarded to Trevor VK6ZTJ, from Tambellup, for his well-documented modifications to convert an FM-92 to 6 m, he received a different DMM, donated by Atkins Electronics.

A special mention must be made of the excellent IOTA display by Mal VK6LC, featuring photographs and QSL cards from around the world. Mal's efforts in the north-west of WA show the amount of organisation and hardship involved in mounting a DXpedition to a remote location. He has promised to erect his Australian 4 Square phased vertical antenna at next year's Hamfest!

The following NCRG members involved

in organising this event are to be congratulated for their efforts: John VK6ATA, James VK6FJA, Mel VK6TVA, Keith VK6XH, Darragh VK6ZDW, and Des VK6ZJ. Special thanks go to Mel VK6TVA for his ATV display, to Robert VK6NAD for his truck-mounted satellite station, and to Phil VK6ZPP for providing much of the above information.

WAADCA

The following was received from Phil VK6AD, who is president of the Western Australian Amateur Digital Communications Association Inc (known as WAADCA, pronounced wad-kah), which is affiliated to the VK6 Division of the WIA.

"We have seen a surge of interest lately in packet radio, from both new-comers to the hobby and from old hands. Our series of presentations on packet radio has resulted in a number of frustrated hams coming forward with their packet radio problems. This is really exciting because many of these people would otherwise lose interest and turn their attention away from radio, towards the Internet or other interests.

"Since implementing our Internet gateway station, which provides packet links to similar stations around the world, we have noticed a dramatic increase in the number of packet bulletins arriving at our BBS. Some days we see over 300 new messages arrive. This is great from the perspective of keeping up-to-date with world Ham radio activities, but it does have a down-side too. Imagine the poor packet operator trying to wade through all of those message headers to find something interesting! On some popular BBS frequencies, users running TPK and similar software usually request a broadcast of the mail headers soon after they switch on, which results in several minutes of extra activity on the channel. It is common to find this repeated throughout each evening as users turn on their systems and re-sync their message lists. Another insidious problem is that the high volume of traffic is being used as an excuse by some sysops to replace existing radio forwarding links with Internet links. Perhaps the most annoying development for some users is the high volume of junk mail bulletins containing trivial jokes and gossip.

"There is a wide range of options open to us to solve these problems. The easiest would be to simply not handle mail addressed for @WVW distribution. At least two BBSs in WA have already opted for this solution. Other options include using different BBS software, which puts incoming mail into "pigeon holes" depending on the subject. One pigeon hole can be set up for "humour", another for "antennae", etc

Each user would also have their own personal mail pigeon hole. Most of the NOS software works this way and the scheme is very popular in Europe and the USA. This is also how the Internet works, with each news-group representing a pigeon hole.

"Early in the new year, we hope to implement some changes along these lines at the club BBS (VK6WFH, 144 725 MHz). We shall keep you informed of progress and results.

"WAADCA meets at 8 pm on the first Wednesday of each month, in the Meeting Room of the Wireless Hill Telecommunications Museum, Ardross. As always, non-members are welcome to attend."

If You Have Material...

Material for inclusion in this column may be sent to VK6NT @ VK6ZSE.#PER.#WA. AUS.OC, or to PO Box 169, Kalamunda WA 6076, or via telephone on (09) 291-8275

"QRM" News from the Tasmanian Division

Robin L Harwood VK7RH

Well, another calendar year is rapidly coming to its conclusion. It has been a rather traumatic one for this State, especially after 28 April. We are hoping that 1997 will be much better than what has happened over this past year. December is always a very busy month, ending up with Christmas and the New Year festivities and, on behalf of your Divisional Council, I extend Season's Greetings to all members of this Division and their families.

Divisional Council conducted a telephone hook-up in November as the amount of business did not warrant travelling for a full meeting. Telephone conferences have been previously held but were confined to specific issues that needed speedy resolutions. They can be very cost effective in terms of time and money. However, a full face to face meeting will still be necessary before the Divisional Annual General Meeting, which is scheduled for 22 March. There will be further details concerning this in next month's column. The deadline for nominations for Divisional Council will be 22 February and there are some councillors who have indicated that they do not wish to re-nominate. So think now about contributing to your Division.

Subscriptions for 1997 have increased by \$2 in all categories. These now are: Full \$74, Concession \$60, and "X" (that is without *Amateur Radio* magazine) \$46. Please note that those who wish to apply for the Concession grade for the first time will have

to quote their relevant Social Security number which can be checked.

The Southern Branch is the only Branch scheduled to hold a regular monthly meeting. It will be held as usual at the Domain Activity Centre on Wednesday, 4 December at 2000 hours.

The Northwestern Branch will be holding their annual Christmas Dinner at the Bass & Flinders Motel in Ulverstone on Tuesday, 11 December. I am certain it will be a very well

attended function where the annual Joan Fudge Memorial Award will be presented.

The Northern Branch is unable to meet at their regular venue this month and, anyway, it has been the usual practice to have an informal get-together. For details of what activity is planned, listen in to VK7WI on Sundays.

Well, that is all for 1996. A very happy and peaceful Season to all.

FTAC Notes

John Martin VK3KWA, Chairman, Federal Technical Advisory Committee*

More Microwave Records

Doug Friend VK4OE and Adrian Pollock VK2FZ/4 have set an inaugural VK4 record for the 13 cm (2.4 GHz) band. The distance is 224.8 km. On 24 GHz, we have two inaugural state records. Alan Devlin VK3XPD and Russell Lemke VK3ZQB have made two contacts over 12.3 km and 48.4 km. Trevor Niven VK5NC and Colin Hutchesson VK5DK have set a VK5 record distance of 38.5 km. Congratulations to all.

Packet Housecleaning - Not an Easy Task

It seems that there always has to be a raging controversy on the packet network. There are some packet operators who wield their keyboards like a crocodile wields his teeth, and any hint of controversy brings them out of the swamps with their jaws clacking.

This time the debate is about the SMA regulations on advertising. The question is basically whether they mean what they say, or whether they can be twisted to mean the opposite.

One of the cornerstones of the amateur service, since long before I can remember, has been that amateur operation is non-commercial. That is what the word "amateur" means, after all. Our licence conditions state quite clearly that we must not use our stations for financial gain, or to transmit any message that is, or includes, an advertisement.

Is this understood on the packet network?

By and large, of course it is. But a significant minority of packet operators do not appear to understand it. Others are trying to find a loophole, so they have been studying the meaning of the word "pecuniary" in their dictionaries.

Not that it matters of course. The phrase "pecuniary interest" is part of the ITU

definition of the amateur service, but it isn't the SMA regulation. And for some unfathomable reason, the SMA has never seen fit to publish our licence conditions in dictionaries!

There is another group of packet operators who know full well that advertising is illegal, but go ahead and do it anyway. Some of them give the excuse that if the WIA is authorised to include disposal notices in their broadcasts, then so should everyone. It also gives the anti-WIA brigade an ideal opportunity to sling off about "discrimination" and "WIA privileges".

Of course that isn't the point either. The WIA is an organisation, not an individual. No individual amateur, WIA member or not, is permitted to advertise on the air. So we are all treated equally and no-one is being discriminated against. If the WIA disposal notices are such an annoyance to some packet operators, then they should be dropped. Then there would be no excuse for anyone to knowingly ignore the regulations.

All this might sound authoritarian, but I feel that there are too many amateurs - especially on the packet network - who have forgotten that we are required to play by the rules. Our licences are not for advertising, playing records, conducting business transactions, religious preaching, political commentaries, or anything like that. They are for technical experimentation in generating, propagating and receiving RF. That's it - nothing else!

So to those packet operators who think they have a right to do whatever they like, I would say: KNOCK IT OFF! You are letting the side down! The rules are there for our benefit, and it's time you realised it.

*PO Box 2175, Caulfield Junction, VIC 3161

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How's DX?

Stephen Pall VK2PS*

During the year one of the many popular discussion subjects in amateur radio circles was the decline of solar cycle 22 and the imminent rise of a new cycle. Everybody wanted to know the exact date of the minimum of the cycle. Had it occurred already? Did they miss the important event without noticing it? Is the minimum still lingering in the doldrums?

To get up-to-date information on this subject, as always I consulted Dr Richard Thompson, a solar scientist with the IPS Radio and Space Services in Sydney (see *How's DX*, May 1995, October 1995 and May 1996 for more information on this subject).

Dr Thompson has just returned from an important meeting of solar and space scientists held in Boulder, Colorado. Scientists from the United States, Germany, United Kingdom and Australia (represented by Dr Thompson) took part. Among other subjects, they discussed the future of the coming cycle 23. It was the considered opinion of these 12 people that we have now passed the minimum of cycle 22, and we are moving along on the bottom of the new cycle 23 without actually observing any significant changes. According to Dr Thompson, it is still difficult to pinpoint the exact date of the minimum of cycle 22 which, according to his opinion, occurred between July and November (most probably in the middle of September 1996).

Scientific data is still coming forward and there will be at least another 6-10 months before the exact date can be established. It has to be noted, however, that in the period of September/October there were 37 straight days without any visible spots on the sun.

Here is what Dr. Thompson says about the spotless days on the sun: "This 37 days sequence is longer than any during recent solar minima, and is consistent with the current minimum being 'deeper' than those during recent solar cycles. But how does this sequence compare with historical sequences from the record of sunspot observations? The following data makes this comparison for observations since 1900.

(The numbers are year of sequence and number of spotless days.) 1913 (92), 1901 (69), 1902 (49), 1902 (45), 1912 (43), 1901-2 (40), 1924 (39), 1913 (39), 1996 (37), 1933 (36), 1944 (36).

The data shows that the 1996 sequence, whilst impressive, is still considerably shorter than some early in the century

However, a note of caution is required because the coverage of observations was not nearly as good early this century as it is now. A sequence of spotless days can be broken by a single day on which a small spot appears. Lack of coverage by observations could therefore be very important in determining the length of such spotless sequences. With the above qualification, the sequence in 1996 is still the longest observed in the last 50 years during which good observations have been available."

It was the considered opinion of the group of scientists that the peak of cycle 23 will come around early in the year 2000 with a maximum sunspot number of 160. For the immediate future it will be March/April 1997 before we can experience real improvement in propagation.

With these cheerful thoughts I wish all my readers a Merry Christmas and a Happy New Year

Heard Island - VK0IR

Preparations for the Heard Island DXpedition have been in high gear for most of the past year. Heard Island may represent the most difficult and complicated DXpedition ever attempted. The 1995 attempt on Heard Island was aborted and resulted in financial disaster for the team. The project was then reorganised, and the team enlarged to 20 radio operators in order to reduce the cost per person. Additional equipment, procedures, and travel arrangements were included to ensure safety and success. In September/October 1996, two 20 foot containers with more than 10

tons of equipment were shipped to Reunion Island, the starting point of the expedition. The gear includes complete life support and radio equipment and a multitude of antennas for 20 persons for the two week stay on Heard Island.

The expedition team has been essentially intact since it was formed in January 1996. Currently it includes EA8AFJ, HB9AHL, K0IR, K4UEE, K9AJ, KK6EK, N6EK, N6MZ, NP4IW, OE9AMJ, ON6TT, PA3DIU, RA3AUU, VK2TQM, W60TC, W8FMG, WA0PUJ, WA3YVN, KA6W and 9V1YV. Expedition leaders believe they have assembled a great mix of phone, CW, and RTTY operators with a bias towards low band operations (160, 80, 40 and 30 metres). Good openings are anticipated on 20, 17 and 15 as well, with fair to sporadic openings on 12 and 10 m.

Modern technology will be employed and the team will log using a CT-network. Every day the logs will be uploaded via Pacsat to a central site for posting on the World Wide Web. Anyone will be able to enter basic information about a QSO and receive confirmation that the QSO is in the log. Extensive use of pilot operators will help the Heard Island team to get feedback, to ensure success of the DXpedition.

The team will assemble on Reunion Island during the last week of December. On 3 January 1997 they will leave aboard the 300 ft French vessel *Marion Dufresne* for a 10-day sail to Crozet and then Heard Island. If weather permits, the equipment will be put on the island by helicopter; if not, it will be landed by boat.

The stations will come on the air on or before 15 January 1997, using the call sign VK0IR. The NCDXF five band HF beacon will be set to transmit continuously during



Dan C91CB in his shack in Maputo.

the stay. Departure will occur on 27 January 1997 and, after a brief stop on Kerguelen, will sail to Reunion, arriving on 5 February 1997.

The Heard Island DXpedition team is committed to carry out this operation in an exemplary manner. Every effort will be made to ensure the maximum number of QSOs on as many band/modes as possible while minimising interference to other amateur interests.

It is envisaged that the DXpedition will work the amateurs on a "continent" basis. They have three "continents" in their planning, Asia/Pacific, Europe/Africa/Middle East, and the Americas, and they will use peak propagation periods to do this.

Each one of us in VK/ZL had the experience, when working an Antarctic expedition in the past (Bouvet, South Sandwich, Peter I, Macquarie) of being swamped by powerful USA and Japanese stations. I have approached the organisers of the expedition and suggested they have a separate "VK/ZL only" segment in their band activities when calling for the different "continents". This would separate the many amateurs in Australia and New Zealand from the rest of the Pacific, which sometimes becomes a battleground between amateurs situated on the Eastern and Western rim of the Pacific Ocean. I have been assured that our region will receive special attention as a calling area. Let's hope the promise will translate into reality.

The total budget for the expedition is \$US320,000. Almost two thirds of this cost is transportation to Heard Island, which is remote from any normal shipping lanes. The balance of the budget is required for special gear and services, such as shelters, food, fuel and transportation of equipment. An example of the high cost of this operation is the charge for shipping and storing the containers of gear.

As of mid-October 1996, about \$US260,000 has been raised or is guaranteed, leaving about \$US60,000 to be obtained. Donations will be gratefully accepted via Heard Island DXpedition, c/o Bob Allphin, K4UEE, 4235 Blackland Dr, Manetta, GA 30067 USA. Donations are not at risk. The expedition team is taking all financial responsibility until the expedition is completed. Should the project fail due to other causes than an Act of God, the donors' money will be returned. The most complete set of information about the expedition is available on the Web pages at <http://www.ccnet.com/~cordel/UHI>

Mozambique - C91CB

It was around May/June this year when Dan C91CB was almost a daily contact on



The AEA Isoloop antenna used by C91CB on the balcony of his apartment.

the ANZA net around 0530 UTC with never too strong but quite workable signals. The biggest problem was QSLing. It seems very few letters have landed in his Maputo post office box, which frustrated his QSO partners who eagerly waited his reply card as proof for the first contact with that country. Some months ago Dan returned to his home town in Canada for a short rest and recuperation and there he managed to organise a QSL manager to look after his cards. His QSL manager is Fred de Wind VE3WFN, Box 182, 201-B-Hammill Road, Red Lake, Ontario, Canada, POV 2M0.

In a letter posted to me from Maputo on 3 October, Dan has written, among other things, "I work here in Mozambique as an aircraft engineer for a non-government organisation based in California, but with work stations in Maputo, Djibouti as well as Tbilisi, Georgia. I have been operating as C91CB since July 94 and I have made, so far, about 1600 QSOs. My contract with the company runs for another two years, but there is no guarantee that I will spend all of the next two years in Maputo. I am here with my wife and a six year old son. I operate with a Yaesu FT-900AT, barefoot into an AEA Isoloop antenna (see photo) which hangs off my balcony on the 18th floor, making it about 170 feet up or so, and faces east towards the Indian Ocean. I usually operate on 20 metres these days as things are pretty bleak on the other bands. I cannot work on 40 or 80 metres as this miniature loop antenna will not tune up on that frequency. Well, I must run now. I listened on the ANZA net today; Bill the controller was faint, but the VK6s boomed in as usual as well as a ZL or two".

Dan closed his letter saying that he now has a South African address for correspondence which, he hopes, will deliver him the letters more safely. Dan

Swedberg, PO Box 1276, Nelspruit 1200, Republic of South Africa.

Future DX Activity

- * Ulli will be active from Roemoe Island as OZ/DL2HEB (IOTA EU-125) from 22 December to 3 January. QSL via DL2HEB or via the Bureau.

- * Gerard F2JD/SR8EN will be going to Panama for at least 6 months and hopes to be active from there.

- * Tex 9M2TO has installed his 80/160 dipole and is active. QSL via JA0DMV via the bureau.

- * Alex PA3DZN (formerly 9XSEE, 9Q2L, etc) has arrived in Luanda, Angola and received the call D25L. QSL via PA3DMH.

- * There are plans to activate Pratas Island BV9P in March 1997.

- * Eric F5CCO will be active in November and December from Tahiti.

- * The proposed St Paul Island DXpedition CY9 has been postponed because of bad weather.

- * Dave KC9IM is now active in Guinea Bissau as J52IM and has antennas for 80 and 160 metres. QSL via KB9XN.

- * The planned Syrian operation of a group of 23 Germans (YK0B) has not taken place due to misunderstanding with local authorities.

- * Larry TZ6VV is now active from Mali. QSL to Larry Erwin, BP 395, Segou, Mali, Africa.

- * Ray 5R8FK and his wife Donnie 5R8FJ are now active from Madagascar. Their address is Ray Shankweiler, BP B20, 101 Antananarivo, Madagascar. However, they warn that mail pilferage does occur.

- * Rick K3IPK is active again from Senegal as 6V6U. QSL via his home call.

- * Prabhu VU3PDD is active from the Indian Main Antarctic Base with the callsign VU2AXA.

* There will be some activity from French St Martin with the callign FS/W2QM from 4-11 December.

* Jim ZD9CR is now active from Trstan da Cunha. He can be heard on 14240 at 2000 and on 21335 at 1300 and 1800 UTC.

* Yvette F3YA is on Tokelau Island for the next three years. Her callign is ZK3YA. She is active sometimes on 7003 kHz between 1000 and 1100 UTC. QSL via home call.

Interesting QSOs and QSL Information

* VQ9WM - Bill - 14250 - SSB - 0606 - Sep (E). QSL via K7IOO, William C Moore, 405 Roosevelt Rt 1, Grand Coulee, WA 99133 USA.

* V44NEF - Earl - 14164 - SSB - 0530 - Sep (E). QSL to Earl Francis, POB 565, Charlestown, Nevils Island, West Indies.

* ET3BT - Telashan - 14250 - SSB - 0530 - Sep (E). QSL via Box 6228, Addis Ababa, Ethiopia, Africa.

* JW8GV - Ola - 14195 - SSB - 1102 - Oct (E). QSL to Ola Johan Ostvig, POB 27, N-9170, Longyearbyen, Svalbard Island, Norway.

* R1ANT - Yura - 14164 - SSB - 0555 - Oct (E). QSL via POB 600, 198206 St Petersburg, Russia.

* GB800SA - Terry - 14196 - SSB - 1036 - Oct (E). QSL via RSGB QSL Bureau, PO Box 1773, Potters Bar, Herts, EN6 3EP, England.

* HS0G4JMB - Phil - 14182 - SSB - 1045 - Oct (E). QSL via Box 7, Bangkok, 10506, Thailand.

* SV2ASP/A - Apollo - 14195 - SSB - 0558 - Oct (E). QSL to Apolo Monachos, 1 Moni Dochariou, GR-63087, Agion Oros, Greece.

* F00SUC - Joel - 14260 - SSB - 0728 - Oct (E). QSL via F5JJW, Joel Suc, La Grange, 69440, Taluyers, France.

* Z3ZXX - Dargan - 14222 - SSB - 1336 - Oct (E). QSL via EM6ON, Mike T Jakiela, POB 286, Poway, CA 92074, USA.

* 788T - 14023 - CW - 0658 - Oct (E). QSL via Palau DXpedition, PO Box 88, Morris, OK 74445-0088, USA.

* FW201 - Rich - 14192 - SSB - 0454 - Oct (E). QSL via DJ4OI, Richard Hanss, Falkenburgstr 14, D-67122, Altrip, Germany.

From Here and There and Everywhere

* Jack FT5WF told Bill VE4UA that December will see the change-over of the science personnel on Crozet and Kerguelen Islands. A total of 16 new people will come, hopefully some amateur operators amongst them.

* Mirny, the Antarctic Russian base, has

51 personnel and two active radio amateur stations, R1ANZ and R1ANT.

* Jacques FR5ZU/I was active from 25 to 29 October from Tromelin Island, which gave the opportunity to a number of VE stations to work this rare DX country. QSL via FR5ZU.

* The JA1UT DX Group had a successful short operation from Myanmar from 25 October to 4 November using the calligns of XY1HT, XY1VMY and XY1U. The group consisted mainly of European and Japanese operators. QSL via JA8RUZ.

* The ZS8IR cards have been finally printed and Chris ZS6EZ has started QSLing.

* In 1994 Belau (Palau) declared its independence from the USA. Consequently a new prefix, T8, has been assigned to Palau.

* Gus 5X1D has now left Uganda. QSL via SM0BFI.

* Dragan ET3YU has moved from Ethiopia back home, so future QSLs for his Ethiopian activity should be sent directly to Dragan Stojanovic, Dusan Vukasovic 82/20 11070 Novi Beograd, Yugoslavia. He made 14,000 QSOs but exchanged only 4,000 QSLs.

* WA4DAN, AH9C, KW2P, AA4VK and VK2BEX were active from Sable Island from 22 to 28 October. Did any VK work them apart from VK3ZC on 7 MHz?

* VK4IS, in a packet bulletin, advised that he is not the QSL manager for the pirate station VK0HD which was active lately.

* Leif SM0BFI, QSL manager for Gus 9Q5TE for the activities in August 1989 and April 1993, advised that he is closing the logs for those operations on 31 December 1996.

* Martti OH2BH has returned to his new home in Finland after a tour of duty in Hong Kong, Korea and Singapore.

* Phillip Weaver VS6CT, who for years provided many amateurs world-wide with a contact from Hong Kong, retired from the Search and Rescue Group he formed. After a world-wide vacation he took up residence in Thailand and is active now as HS0G4JMB.

* If you send cards to the Libyan operators direct, use registered mail only. There are three operators with three different addresses. Ali, PO Box 80462, Tripoli, Libya; Usama, PO Box 78665, Tripoli, Libya; and Abubaker, PO Box 74421, Tripoli, Libya.

* KP3 is a new prefix assigned to Puerto Rico. KP3 to extra and advanced classes, NP3 to general and technical licensees and WP4 to novices.

* Bill Kenamer, DXCC manager, said that all operations and QSL activities of

Romeo Stepanenko, including those as QSL manager "Roy Rogers" 9H3UP, are now disqualified from the ARRL DXCC program. Cards verified after 23 August 1996 by 9H3UP are not valid for DXCC. EM1KA cards issued by JAZ2PA are valid.

* Send your cards to FY5YE via W5SVZ (new manager).

* More and more KH7 calls are heard these days. They are from Hawaii and not from Kure Island. Kure now has the prefix KH7K.

QSLs Received

8R1Z (7 w - op); YW0RCW (30 m - YV5AMH), ZD7VJ (6 m - G4ZVJ), DX9C (10 m - DU9RG); SV7M (4 m - DL7ALM); J87CQ (4 w - N4FTR).

Thank You

Many thanks to all those who supply me with news and other information. Special thanks to VK2XH, VK2KFU, VK2TJF, VK2TQM, VK4UA, VK8KD, VK8AV, VK9NS, WIA L40370, C91CB, K4UEE, ARRL DX Desk, QRZ DX, The DX Bulletin, The DX News Sheet, INDEXA, The 425 DX News, and GOLIST QSL Managers list.

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Novice Notes

Peter Parker VK1PK*

The Basics of Transmitters - Part Two

Last time you heard about CW and AM transmitters. In this month's column, we discuss double sideband suppressed carrier (DSB) and single sideband suppressed carrier (SSB) modes. The promised coverage of RTTY and digital modes will be held over to a later issue to make room for a new feature, called "Novice Plus".

Double Sideband (DSB)

As the name suggests, a double sideband signal consists of two sidebands, both carrying information. In this regard it is similar to an AM transmission. However, the two modes differ in that AM signals comprise upper and lower sidebands on either side of a steady carrier signal, whereas DSB signals comprise only the two sidebands, the carrier being suppressed by special circuitry inside the transmitter.

Because double sideband is comparatively easy to produce, it finds some use amongst those who build their own equipment. DSB has the following advantages over AM:

- * Greater transmitting efficiency – the carrier component of an AM signal carries no information. By removing the carrier and concentrating power in the sidebands, a more effective signal is the result.

- * With no high power modulator being required, DSB transmitters are easier to build than those for AM.

- * By adding a product detector and audio amplifier, it is possible to convert any DSB transmitter into a direct conversion transceiver, compatible with modern SSB equipment

A Typical DSB Transmitter

Figure 1 is a block diagram of an eighty

metre double sideband transmitter. Like an AM transmitter, it contains an RF (carrier) oscillator, a microphone amplifier and a power amplifier stage. However, the circuitry of the microphone amplifier and the power amplifier stages is different in each case; a power amplifier from an AM transmitter is unsuitable for DSB service, while a speech amplifier from a SSB or DSB transmitter would be unable to fully modulate an AM transmitter unless additional stages were added.

Carrier Oscillator

As with all transmitters, the process starts with the generation of a radio frequency signal. Like CW or AM transmitters, the oscillator's frequency is the same as the desired transmitting frequency. While the transmitter of Figure 1 uses a crystal oscillator, other techniques, such as ceramic resonators, free-running variable frequency oscillators, or frequency synthesisers could be used instead.

Microphone Amplifier

The next stage we will look at is the microphone amplifier. This is simply an audio amplifier that amplifies the low-level electrical impulses from the transmitter's microphone. The amplifier's output must be sufficient to drive the balanced modulator. Fortunately, the output required is not high, and one or two audio transistors or operational amplifier integrated circuits (such as the popular 741) will do the job. This is different from AM transmitters, which require much more powerful audio amplifiers (modulators) to achieve the 100% modulation needed for optimum results.

To reduce occupied bandwidth (and thus lessen band crowding) while maintaining intelligibility, the transmitter's audio

frequency response is normally restricted to 300 Hz to 3 kHz. In DSB equipment this is achieved by restricting the frequency response of the audio stages. A judicious choice of component values in the speech amplifier stage and the use of a communications-type microphone will normally suffice here. Note, however, that while the audio bandwidth of a DSB signal is about 3 kHz, the actual signal is 6 kHz wide, due to both sidebands being transmitted.

Balanced Modulator

The heart of a DSB transmitter is its balanced modulator. This stage, which is essentially a mixer, combines the RF signal from the crystal oscillator and the audio signal from the speech amplifier to produce a double-sideband RF signal. The level of this is proportional to variations in the operator's voice.

Ensuring that signals applied to the inputs of a mixer stage do not appear on the output can be difficult. While the audio signal from the speech amplifier is easily dealt with, it can be difficult to obtain proper suppression of the carrier signal generated by the crystal oscillator. The result of this is a transmission sounding more like AM than DSB, as a portion of the carrier signal finds its way through the balanced modulator to subsequent amplifier stages, and then to the antenna

Balanced modulators normally use some form of balanced (or symmetrical) circuit configuration (eg two or four diodes or transistors) to aid carrier suppression. As well, a "set and forget" trimmer potentiometer may be included to compensate for (or "null out") any remaining imbalances which could harm carrier suppression. This control is set for minimum carrier output, which usually occurs near the middle of its travel. In the past, balanced modulators have been somewhat critical to build and adjust. However, the availability of integrated circuits such as the NE602 has made their assembly much easier

Driver and Power Amplifier

While both CW/AM/FM and DSB/SSB transmitters require power amplifiers to raise output to a level sufficient to obtain contacts, the amplifier circuitry required in each case is somewhat different. This is because DSB and SSB transmitters require a linear RF power amplifier chain for the transmitted signal to be intelligible

A linear amplifier is one in which the power output is directly proportional to the strength of the signal applied to its input. Thus, if a hypothetical power amplifier provided 20 watts output for two watts input,

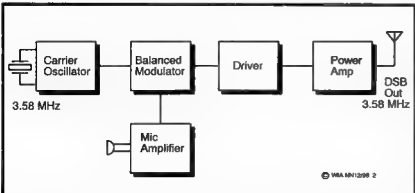


Fig 1 - Double sideband transmitter block diagram.

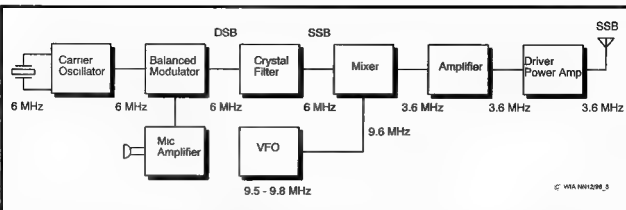


Fig 2 - Single sideband transmitter block diagram.

it should produce 20 milliwatts for 2 milliwatts input; a power amplification ratio of ten in both cases. This characteristic is achieved by applying a bias voltage to the base of amplifying transistors.

Linear amplifiers generally draw more current for a given power output than non-linear amplifiers, ie they are less efficient. This also means that better heatsinking of the power transistors is required. Nevertheless, this drawback is a small price to pay for the greater efficiencies obtainable by suppressing the transmitter's carrier

Single Sideband

SSB is the most popular mode on the HF bands today. While harder to generate than DSB, it has the advantage of requiring a lesser bandwidth than DSB, making it more suitable for use on crowded bands. Whereas a double sideband signal contains one lower sideband and one upper sideband, both carrying identical intelligence, an SSB signal has just one sideband. This is normally achieved by special filtering circuitry in the transmitter - more on this later

An SSB Transmitter

A block diagram of a simple 80 metre SSB transmitter is shown in Figure 2. It has many similarities with the DSB transmitter of Figure 1 but contains additional stages, namely a crystal filter, mixer and variable frequency oscillator. The transmitter described here is based on an actual design developed by Drew Diamond VK3XU (Reference 1).

The transmitter produces a low-level DSB signal by mixing the audio signal from the speech amplifier with an RF signal from a crystal oscillator. This is accomplished in the balanced modulator. Note that, in contrast to Figure 1, the carrier oscillator is operating on 6 megahertz.

The 6 MHz DSB signal is filtered by a crystal filter. This filter, with a bandwidth of only three kilohertz, is so sharp that it

eliminates one half of the 6 kHz-wide double sideband signal. After the filter we are left with a 6 MHz single sideband signal. Because of the filter's sharpness, the precise frequency of the 6 MHz carrier oscillator is critical. Shifting the oscillator upwards leads to a corresponding rise in the frequency of the DSB signal from the balanced modulator. Because the frequency of the filter is fixed, only the lower frequency sideband is transmitted (Figure 3). The reverse happens when the carrier oscillator

frequency is lowered; in this case only the upper sideband is passed by the filter. While there is no longer any justification for it, amateur practice has been to use lower sideband (LSB) on bands below 10 MHz, and upper sideband (USB) above 10 MHz.

As 6 MHz does not fall within any amateur band, and frequency agility is desired, we need to use a second RF oscillator and mixer to shift the frequency to 3.5 MHz. This is accomplished by mixing the 6 MHz SSB signal with a signal from a

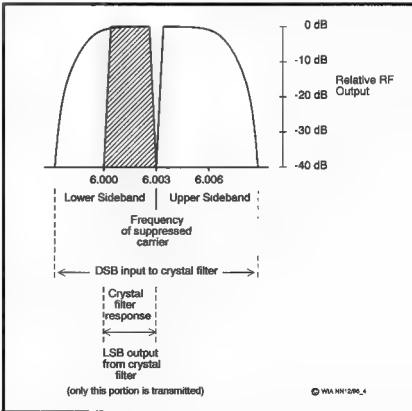


Fig 3 - A crystal filter produces a SSB (LSB) output from a DSB input.

variable frequency oscillator. By making the variable frequency oscillator tune 9.5 – 9.8 MHz, it is possible to obtain an SSB signal in the 3.5 to 3.8 MHz range (9.6 MHz – 6 MHz = 3.6 MHz).

Having generated an SSB signal in the desired amateur band, all that remains is to amplify it to a practical power level. This is accomplished by several linear amplifier stages, which are identical in all respects to those used in the DSB transmitter.

Conclusion

The above has given an outline of the operation of DSB and SSB transmitting equipment. The block diagrams used are based on actual designs built by home constructors. While current commercially-available equipment makes use of other means of generating VFO signals (such as the use of a frequency synthesiser), and more stages of mixing (to permit operation on all bands) the basics as described here remain valid.

Reference

1. *Diamond, D Radio Projects for the Amateur, 1995*

*7/1 Garran Place, Garran ACT 2605
VK1PK @ VK1KCM.ACTAUS.OZ

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Novice Plus

Helping You Get More From Your Amateur Licence

VHF/UHF Field Day

* The WIA invites Novice and Novice Limited licensees to participate in its annual VHF/UHF Field Day, being held on the weekend of 11/12 January 1997. The event is a contest where participants make as many contacts as possible on VHF and UHF. The contest favours portable operation, though you may participate if transmitting from home. Take your hand held or mobile rig to the top of the nearest hill, and see how far you can work simplex – you'll be surprised. Or involve your local club in the activity, and establish a multioperator station. Try 146.500 and/or 439.000 MHz for starters – these are the national FM simplex calling frequencies. The rules are in this issue of *Amateur Radio*, in the Contests column. Contest operating procedures were covered in August's *Novice Notes*.

Handheld Antenna

* Can't afford the high cost of commercially-made antennas for your hand-held? Why not build one yourself? A quarter wave whip for two metres offers considerable gain over the supplied helical, and gives a stronger signal into the repeater or on simplex.

Take a standard PL259 plug (preferably the type made for thick cable such as RG8 or RG213) and a 50 cm length of stiff copper wire or rod. This should be thin enough to slide inside the PL259's centre pin. Coat both the inside of the PL259 inner connector and one end of the wire or rod with solder. Then apply heat to the centre pin of the PL259, insert the rod through the rear of the plug and allow to cool. Use either insulating tape or a rubber grommet to ensure that the rod cannot touch the rear of the plug. With the use of an appropriate adaptor, the antenna can now be used on your handheld transceiver.

A finishing touch may be to glue a toothpaste tube cap or toggle switch nipple to the end of the antenna for safety. As the antenna is three-quarters of a wavelength long on UHF, it should also be effective on 70 centimetres.

International Amateur Radio Union Monitoring Service (IARUMS) – Intruder Watch

Gordon Loveday VK4KAL*

The 80 m band is currently subject to low solar activity, resulting in utility stations in Asia being received at good strength, stronger than usual. There are also five broadcast stations in the 80 m band: they are intruders, so log them! All of the above causes the amateur service to suffer QRM. When the solar activity increases and cycle 23 commences to rise, the above conditions will reduce DX, and possibly many amateurs will leave the overcrowded 80 m band for higher frequencies.

This is when the full impact of intruders will be felt. The 7 MHz band is plundered by two way radio stations north of VK. When you add intrusions by other countries, such as Russia with CW beacons, FIB (RDL style), two or three R7B, plus CW using Russian Morse and many others, little space is then available for amateurs. Compounding the issue more will be the migration from 80 m.

What more reason do you need to join your fellow amateurs submitting logs to the Monitoring Service?

Well, here's more reasons. Although solar

activity was low in October, short openings on the 14 MHz band did occur, with even shorter openings on 18 and 21 MHz. These brief openings revealed intruders already in operation, giving a sample of things to come. Heavy intrusions from Asian CW, phone, and Russian RTTY (FIB) and CW were heard. When cycle 23 does open up the bands, 28 MHz will reveal the problems encountered in cycle 22 have not gone away, plus harmonics of "rotten" transmitters will resurface.

The main outlet for RDL Moscow Naval Radio (UMS) seems to be on 14.211.5 MHz until 21.032 MHz re-opens for traffic (information gleaned from VK4AKX October notes).

Military intruders have been found with increasing regularity over the past couple of months. CW, voice and RTTY type transmissions have been logged Radio telephony conversations in the 40 m band are a curse and some locals are spending many hours trying to jam them. Most are Asian, Indonesian and Chinese.

Radio Veritas, operating on 7.105 MHz, is quite legal, but the station splatters down to 7.097 MHz which is NOT legal. The station is in the Philippines and information received lists it as "almost an external arm of Vatican Radio". It transmits in Hindi, Urdu, Bengali, Tamil and Telugu.

*Federal Intruder Watch Co-Ordinator, Freepost No 4 Rubyside QLD 4702 or VK4KAL@VK4UN-1

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**Prevent pirates – make sure you sell
your transmitter to a licensed
amateur**

Pounding Brass

Stephen P Smith VK2SPS*

My intended article for this issue was the **QRP-Plus Transceiver**. However, due to problems in my Canon camera, this article will now feature in the January issue. This month's issue will contain, instead, a number of articles dealing with different Morse related matters.

A new QRP Club has recently been formed, **The QRP Club of Ireland**. The international QRP week at the Marino Institute of Education in Dublin, Ireland ended with the formation of this club. Further information can be obtained from: Bill Ryan EI8BC, C/o Marino Institute of Education, Griffith Avenue, Dublin 9, Ireland.

On the subject of QRP, Leighton Smart GW0LBI is offering a free award, the **Worked all Wales QRP Award**. To claim the award, you must contact all eight Welsh counties, using five watts or less. Claimants must send a 12x10 inch stamped, self-

addressed envelope, plus a certified list of contacts showing all log details to include, power, mode, date, etc which must be verified by another radio amateur. Further enquires can be made to: Leighton Smart GW0LBI, 33 Nant Gwyn, Trelewis, Wales CF46 6DB. With conditions the way they are at present I wish you luck with this one.

I have just finished reading a 19 page booklet on Morse key tensioners by Dennis Coacher G3LLZ which I purchased from Dennis a few weeks back. This booklet is A4 size spiral bound depicting the types of springs used to control the action of Morse key arm levers. I will review this interesting booklet in a later issue. The booklet is available from Dennis for the sum of 3 pounds fifty (UK), including postage. Further enquires can be made to: Dennis Coacher G3LLZ, 27 Glenview Road, Swindon, Wilts, SN3 4AA England.

Sprat, the official magazine of the G-QRP

Club, had an interesting article appearing on page 11 of issue number 85, about **The G0BZF Micro Keyer**, an ambic keyer on a one inch square PCB. Some of the features offered include: a very small PCB, which can be mounted anywhere; five to 50 wpm speed control via paddle input; dot and dash memories and side tone; wide range of operating voltage from 9 to 15V; option memory message personalised to user; plus many more functions. I have ordered a kit and hope to have it some time in January. When I will report my findings.

If you are interested in the Micro Keyer, you may be able to obtain a copy of *Sprat* for further reading on this most interesting kit.

I've received some interesting letters from readers seeking in-

formation on two Australian made Morse keys, the **Autoplex** by Jock Vail, Burwood, Victoria, and the **AutoMorse**, a three paddle key by N P Thomas of Adelaide (the maker was the Hitchcox Brothers).

The main concern for the collectors is information relating to adjustments. If anyone has any old manuals or information in relation to these keys it would be greatly appreciated and I will pass it on.

On the subject of keys, Brian VK2GCE has informed me that he has acquired a number of British NATO Keys, Key Telegraph 5805-99-591-1939 (made by Price & Edwards Ltd). The key and box weigh 5 lb 9 oz; the key on its own weighs 3 lb 8 oz. Construction material appears to be plated dull brass with the cover being of a blue smooth plastic/fibreglass (see photos).

Further information can be obtained from Brian VK2GCE on 02 9595 2650 or to his address, details of which can be obtained from the Call Book (See photos).

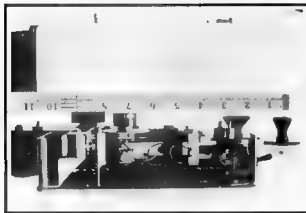
Next month, **QRP-Plus Transceiver**, an honest review.

Coming issues will include information on the MFJ Grandmaster II Contest Memory Keyer, Instant Morse on CD Rom by the RSGB, and Morse programs that can really help beginners.

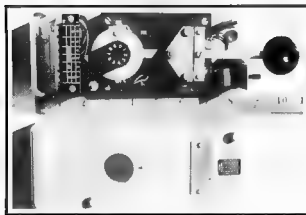
It's amazing how fast the year has gone and 1997 is only a few weeks away. I would like to wish all readers of this column and their families a very merry Xmas and a very safe and happy New Year.

*PO Box 361, Mona Vale NSW 2103

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Side view of the British NATO key and case.



Top view of the British NATO key and case.

Stolen Equipment

The following equipment has been reported stolen. If you have any information that may lead to the recovery of the equipment, please get in touch with the advised contact as soon as practicable.

Make:	Sawtron
Model:	999
Serial Number:	3040164
Type:	UHF radio
Stolen from:	Vehicle in Launceston
Date:	8 October 1996
Owner:	John Gelston
Call sign:	VK7JL
Contact details:	QTHR

BR

QSLs from the WIA Collection

Ken Matchett VK3TL* Honorary Curator WIA QSL Collection

VI50PEACE

As the photograph shows, the special event QSL from the Hervey Bay ARC celebrated the 50th anniversary of the cessation of hostilities in World War II. The call sign VI50PEACE is the longest ever issued in Australia and one of the longest in the world. The WIA Collection also holds the QSL 4J1700GAT from Armenia (1993) also with an incredible nine characters.

The QSL was donated by Brian VK4LV

G5RV

This pre-war QSL, dated 6 October 1935, confirmed a QSO by the famous inventor of the G5RV antenna, Louis Varney. This simple wire antenna is probably the most common of its type for use in the HF bands. Invented in the 1960s, it is essentially a dipole antenna which is fed with 300 ohm slotted ribbon or open wire matching section.

ZD4AB

Pre-war QSLs from the African continent are particularly rare, especially ones from what was then the British Colony of the Gold Coast. The name derives from the quest for gold, spices and ivory by Portuguese navigators in the 15th century.

On 6 March 1957 the country gained its independence and its name changed to Ghana. The QSL shown is claimed by the operator, T F Hall, to confirm the first ZD4 - VK QSO ever.

Thanks

The WIA would like to thank the following for their kind donation of QSL cards to the National Collection: Charles VK7PP and the VK7 Bureau, Ken VK3WM (courtesy of Stan VK3SZ), Frank VK4ZAS, Rennue VI5SUB and the Port Adelaide Radio Club, John VK4ZJB (first 6 m QSO Netherlands/VK), Hans L40370, Bill VK2XT, and the friends and relatives of SK Cliff Manning VK3CJ (courtesy of David VK3DY).

*4 Sunrise Hill Road, Mountaine VIC 3765
Tel (03) 9728 5150

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VI50PEACE



Celebrating the 50 year Anniversary of the Cessation of Hostilities of World War II and in remembrance of the men, women and children who lost their lives during time of war.

CONFIRMING QSO WITH	DATE			UTC	MHz	RST	MODE & WAVE
	DAY	MONTH	YEAR				
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HERVEY BAY ARC, P.O. BOX 829 HERVEY BAY QLD 4655 AUSTRALIA

G5RV

Telephony : W A C : Telegraphy

50 watts C.C. output 100 Kcs Class A Mod. 100% Antenna.

Receiver 1-v-1 AC

VK4BB ~ gto 1425 gmt 6-10-35 RST 599

R. L. Varney,

19, Springfield Park Avenue,
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ARRL

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T. F. HALL, POST OFFICE, ENGINEERING DEPT.

Takoradi, ~~ASABA~~, GOLD COAST, W. AFRICA.

To: VK4BB this confirms QSO
Your RST 579 TX Harvey UHX-10. Input 16-3 RX TRF.3.
Aerial—Single-Wire fed. 67ft. Top Power from Mains.

ZD4AB

Rem rks: This for my first VK one making
me W.B.E. This also was the first
ZD4 - VK qso ever!
Mem. RSGB and ARRL. T3, Sgd. M. Hall.

G3TH-ZD4AB

Repeater Link

Will McGhie VK6UU*

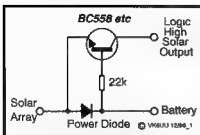


Fig 1 - Solar Panel Detector

Solar

This circuit (Fig 1) must win a prize for using the least number of components and still have a purpose. It detects if a solar panel is charging a battery and produces a logic high out. This logic level could then be used at a repeater site as part of the site monitoring. It could forewarn of solar charging problems at a repeater site, long before the batteries have gone flat, by giving an audible alarm on the repeater's transmission.

As is, of course, it would do that whenever it was cloudy or at night time. The logic output from this circuit needs to be interfaced with a sunlight detector, such as a small solar panel; and by small I mean small. Any simple solar panel external to the main solar array at the site could be installed to provide a voltage when the sun is shining. This, in effect, would be the logic signal to enable the alarm indicator. This small solar panel could, for example, be the power source for the alarm oscillator. You might find the idea useful.

Note the power diode as shown in the circuit needs to be able to carry the full output of your solar array. This diode could be the isolation diode that comes with the solar panel.

A Talk

At a recent VK6 WIA meeting I volunteered to give a talk on the Internet, using examples from the Internet to demonstrate. What better than amateur radio on the Internet and, in particular, voice repeater information on the Internet. I decided to find pictures that related to amateur radio and present, as part of my talk, a slide show. The slide show was presented on the computer that I took along to the meeting.

USA Repeaters

As a result of the research on the Internet

I uncovered an endless amount of information on amateur radio and, in particular, voice repeaters. The bulk of this information is from the United States of America. Americans have embraced the Internet in a big way and so have American amateurs. In particular, many radio clubs in the States have home pages for their clubs. Repeater clubs abound on the Internet with home pages. Most of these clubs have their own logos as well, which I must admit do add a degree of prestige. How many clubs in Australia have a logo?

As an overview of voice repeater information on the Internet, most of these clubs take the business of maintaining a voice repeater and links to other systems, very seriously. Serious may be the wrong word; perhaps professional, important, or keen might be a better word or words. It may be that only the big successful repeater clubs have a presence on the Internet. Perhaps most don't and have poor repeater systems, but for what my research is worth, here is what I found.

Big

My comments from this point on relate to what I found on the Internet in relation to voice repeaters. Big is the best word to describe many of the repeater systems. One club maintained 47 voice and digital repeaters. Much of this system was linked over large areas, with remote control by the users to decide the linking destination of some of the links. A system is partially installed to link together all of the state of Alaska. Several photographs showed some of the extreme locations on snow covered mountains, where the antenna masts are completely covered by a large radome some 15 metres high by two metres across.

CTCSS

If the Internet is any guide, there are a lot of repeater systems in the States. They are on all bands from 29 MHz up. A large number are on six metres. Also of interest, most require a CTCSS tone to access them. These are not private repeaters but open access. The CTCSS requirement is for interference protection of the repeater and the prevention of co-channel interference. Even though pagers in the States are not close to any amateur repeater bands, the large amount of RF is a major problem. The co-channel interference is from several repeaters within a few hundred kilometres sharing the same channel. This appears common in the States.

With such a large number of repeaters, there are just not enough channels to go round.

The solution is, where required, to allocate the same channel in areas that are relatively close to one another. Each repeater requires a different CTCSS frequency to trigger it. You could be mobile in a particular location where access to two or more repeaters, all on the same frequency occurs. The CTCSS requirement means you only access one repeater at a time. Encoding on the repeaters' transmitters would also allow only the reception of one repeater at a time.

Australia

What might be learned from the repeater scene in the USA that could be applied to Australia? The population density of amateurs in the States is unlikely to occur in Australia, so there might always be fundamental differences; meaning, what is right for the States, may not be right for us.

However there are many advantages to running CTCSS, both encoded and decoded. It would greatly reduce the problems we have with pagers, and there are other benefits as well, such as allowing co-channel operation.

Perhaps the sooner we move towards CTCSS operation on some or all of our repeaters, the sooner we will start to reap the benefits. Making this change, however, is not easy. We all have equipment that has no CTCSS capability and suddenly to find you can no longer access your local repeater is a bit annoying. What is done on some repeaters in the States is a system of dual sensitivity, giving preference to CTCSS inputs.

The way it works, is the normal mode on the repeater, which is what you open by transmitting a signal, and hence keying the repeater, is wound back to low sensitivity. In order now to key the repeater, you require to put a good strong signal into the repeater. In effect the repeater is less sensitive. The repeater is also less susceptible to interference. Still not as good as a CTCSS-only repeater, but at least better. In order to access the repeater at weaker signal levels, you require to have a CTCSS tone on your transmission. These two mutes work in parallel. The normal repeater mute allows you access, but you require a strong signal. The CTCSS mute also allows you access but at weak signal levels, the same as you had before the repeater was modified.

VK6RAP

Consideration is being given to modifying one of our repeaters in VK6 to CTCSS operation. The repeater VK6RAP on 6700 is at a site that contains two pagers and numerous other pieces of radio equipment.

The repeater is a Philips FM880, which is the rack mounting version of the FM828 mobile. They were used as outback radio telephone links and make good repeaters.

However, at this site there is an endless number of interference problems, probably all caused directly or indirectly by the two on-site pagers. The repeater has been fitted with two front end cavity filters and a front end crystal filter, and still the interference persists. There is just so much time that can be spent in tracking down and fixing these problems. You locate and fix one, then another pops up. It is just not cost effective.

The amateur population has had to carry the price for the wrong decision to place pagers so close to our two metre band, a situation which I will continue to mention as being unfair. I know nothing will change until technology changes the requirement for the use of the pager band. Until then we just have to put up with it, but we must continue to protest.

That is my exploration of the Internet as it related to my talk to the VK6 WIA. It is worth saying again, there is a lot of information on the Internet relating to amateur radio. The information is very diverse as well. Individuals and clubs put up home pages and links to other relevant information. You could spend more time reading and looking at amateur radio than doing it.

Internet Repeaters

I have had considerable feedback from a mention of working voice repeaters via the Internet. Once connected to the Internet, and running the right software, you can talk via the Internet to other amateurs through their local repeater.

At the time of writing I have not done this yet, but I do know enough now to add some more. In fact, while writing this column, I'm trying to make a contact via the Internet to amateurs in the States. My experience might be interesting so far.

Firstly, to do this you require to be connected to the Internet, and have sound capability on your computer. Next you require two pieces of software. These are IPhone and Repeater Link. IPhone allows you to talk to other Internet users around the world who are running the same software. I almost forgot, you also have to register your callsign with one of the world wide amateur databases. This is to verify that you are an amateur and can use this system to talk through the amateur repeater systems connected to the Internet. This registration is, of course, not required to use IPhone to talk to non amateurs on the Internet.

One way to register your callsign is to connect to QRZ. This is a database of

amateur callsigns. Australian callsigns are not automatically on this database due to copyright or some other reason. You have to register yourself. It may take a day or so for your callsign to be validated. The Internet addresses of all the software and QRZ is at the end of the column.

Now you are set to try this exciting system. First you run IPhone, then you run Repeater Link. There is the usual configuration involved with both programs, but it is too lengthy to go into here. The Repeater Link software is an add-on to IPhone. You operate the system from IPhone. I spent a long time, after having run IPhone and then Repeater Link, waiting for Repeater Link to do something. If it does not, you must go back to the IPhone window. Silly me. I could easily get a job as a dumb software tester. If it worked for me it would for anybody, trust me on this.

After a bit of a wait, those systems that are on line come up in a window. You will see a mixture of various amateur callsigns and the ones with the -R suffix are repeaters. The other amateur call signs are simply amateurs connected to the system, just like you are. There is also a number of non-amateur people in this window. This chat channel is open to all, so many Internet users enter this chat channel not knowing what it is. However, they cannot access the amateur repeater systems as they do not have a valid callsign. They can, however, talk to you and you to them.

First Contact

At this point my Internet system came back on line. I had been trying all morning to set up the Repeater Link and IPhone software. However, there was a problem with my Internet Service provider, and the links to the rest of the Internet, and the software was doing illegal operations. All in all a lot of time spent, hence I continued writing this article. But all was back on line, so I tried the Repeater Link/Ipnone system again, and it worked. There, listed in one of IPhone's windows, was a list of amateur callsigns and a few -R callsigns. My first audio contact was with a repeater in Canada, VE6USE Fort McMurray. I found myself talking to two local amateurs; at last it was working!

Several other repeater systems were then contacted via the Internet. The mode of operation lends itself to amateur type contacts. IPhone contacts on the Internet, even though they can be full duplex, suffer from delays due to the nature of the Internet. Your audio is converted from analogue to digital and packetised. This packet audio is then sent to its destination in segments (packets) and assembled at the other end.

Now, if the first packet gets to its destination quickly and the next takes a second or two, what is the result, how does it work and sound? From what I believe there are two ways to get around the variable delays in the Internet.

One is to delay the incoming packets of audio in a buffer and join them together so there is say, 15 seconds of audio waiting. At this stage you have heard nothing. After this wait time, and there is, say, 15 seconds of audio to listen to, you start to hear unbroken audio. Provided this buffer is made large enough, time wise, there is always spare audio waiting its turn to be heard. Any delays in the Internet mean the length of the audio waiting its turn to be heard, shrinks. Provided the buffer size and the expected worst case delay with the Internet is set up correctly, you hear the audio without any breaks. The Internet can send audio faster than it is live. Each packet of say one second, might contain 5 seconds of real time audio. It is all a question of the parameters set with this system, and allowing for compromise between quality, delay and average worst time network transmission delay. This is a function of those who write this clever software. This is what I believe is used for listening to broadcast stations "live" on the Internet. What you hear is perhaps 15 to 30 seconds after it is broadcast live.

With the Repeater Link software and IPhone contacts, this delay is too long and is shortened. As a result, depending on the Internet network usage, there can be breaks. These breaks, however, don't result in any loss of audio, just interruptions. The audio stops from time to time, but picks up where it left off, so you don't miss any of the conversation.

What's It Like?

So how did it work and sound talking via the Internet to repeater systems? You have the choice of using software PTT or VOX. I found the VOX easy to use. Radio amateur contacts work well with this system, as we are used to having half duplex contacts. With the system running, your callsign is verified and you enter the Repeater Link chat room. There in a window are a number of amateur stations and repeater systems. You select one and you hear fast DTMF tones, followed by the distant "phone" ringing. This is all fake of course, but fun. The ringing is to find out if the distant voice repeater is able to accept your call. If the repeater is in use you hear the activity on the repeater and can join in, just like you do through your local repeater. You can wait for the break between overs, or call over the top. If there is no activity on the repeater you have connected to, you hear either a CW ident or a voice ident, and the

usual repeater tail or pip as well. All very familiar. A Canadian system I connected to has a voice ID that says "you are connected to V6GUSE via the Internet". Talk into your computer mike and announce your call sign and location, and you're in, talking via the Internet to some of these amazing repeater systems.

Quality is good. What does cause a problem is the delay in the Internet, which varies, depending on usage. If there are large delays, then the audio is broken. You don't miss much but there are breaks, or delays. A little annoying but this system can only get better, as software is fine tuned and, hopefully, the Internet gets faster.

What About Us?

All this begs the question, can we connect the Internet to Australian repeaters? We in VK6 are about to find out. A letter is shortly to be to the local SMA telling them we propose to do just that. We await the outcome and I will let you know.

I nearly forgot, where can you find all this software on the Internet? The QRZ Database is at <http://www.qrz.com/cgi-bin/webcall>. The iPhone software is at <http://www.vocaltec.com/The Repeater Link software is at> <http://www.ez1.com/~mebcs/users.html>

I had problems downloading the Repeater Link software. It downloads normally, until the download windows disappears, as if the whole file is now saved on your hard disk. However, the file will not unzip as it is incomplete. A few amateurs have experienced the same problem. I ended up getting my copy from another amateur who had been successful in downloading.

You may be wondering about the Repeater Link software and the name of this column. It is pure coincidence and I have nothing to do with the software.

While checking the Internet addresses of the software above, on the Internet, I came across a home page called, Will's B&W nudes. You would just have to have a look would you not? And may I say this Will is not me. The Internet is like that, you start looking for one thing and end up looking at B&W nudes (all very tasteful). Ah in a day's work of writing a repeater column for *Amateur Radio*.

*21 Waterloo Crescent, Leamurdie 6076
VK6OU @ VK6BBR

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**Tell the advertiser you
saw it in the WIA
Amateur Radio
magazine!**

Over to You - Members' Opinions

All letters from members will be considered for publication, but should be less than 300 words. The WIA accepts no responsibility for opinions expressed by correspondents.

Marconi School Re-union

We are trying to organise a re-union of past students of the Marconi School of Wireless which was located in Sydney until it was closed down in 1981. Ces Bardwell VK2IR started teaching at the School in 1939. In 1949 he was appointed Principal/Manager, a position he held until the school closed.

Ces was very active in the NSW branch of the WIA running courses for new amateurs for about as long as I can remember (and I'm 47 years old).

Ces will turning 80 next year and he will be guest of honour at the function we are hoping to organise. I need expressions of interest from those who would like to attend

a once-in-a-lifetime function. Could *Amateur Radio* run a promotion asking old students to contact me if they are interested in attending? I would need to know the year/years they attended and whether full or part time.

They can contact me by post at the address below or on fax, marking it attention David Hawksworth on 044 210032, or e-mail techfm@peg.apc.org

Hope you can help us organise an event which will recognise an early pioneer of radio/electronic teaching in this country.

David Hawksworth VK2BDJ
84 Duncan Street
Vincentia NSW 2540
ar

Technical Correspondence

All technical correspondence from members will be considered for publication, but should be less than 300 words.

Choice of Toroid Cores

I read with interest the article by Lloyd Butler entitled The Z Match Using a Toroidal Core (*Amateur Radio*, September 1996, p 11). A statement in the article prompts me to write to explain the significant difference between the use of ferromagnetic cores in tuned applications (filters, matching networks, etc) and broadband transformers (baluns). Most experienced amateurs will be aware of this difference but the less experienced may not. Indeed, I have noted a number of people in the electronics industry who are not.

The statement in Lloyd's article in question refers to the same iron powder core being used in a high power balun application as is used in his tuned Z match, the Amidon T200-2. I agree with the writer that what is required in his application is a core which will result in a low loss inductor with an inductance which is stable with temperature and power level and this will result from using an iron powder core. However, for a balun to be effective it must have a high magnetising inductance such that the reactance of this inductance is at least four times the impedance of the transmission line, be it a pair of twisted wires or coaxial cable, at the lowest frequency. The actual value of the inductance is not important as long as it is high enough and so the stability of iron powder is not required.

What is required is sufficient inductance to meet the above criterion. For a 50 ohm balun at 3.5 MHz, $XL(\text{min}) = 200 \text{ ohms}$; therefore $L(\text{min}) = 12 \text{ microhenries}$. Now, the AL value (the inductance of one turn) of the T200-2 iron powder toroid is 12 nanohenries. Hence, the number of turns for an effective balun is 33 minimum. This would be very difficult with coax and cumbersome with twisted wire. Of course the number of turns required reduces with increasing frequency being 16 or so at 14 MHz. But, if a broad band balun is required to cover the HF band (2 - 30 MHz), the T200-2 is not a good choice.

A better choice would be a medium mu (μ) ferrite such as Amidon 61, Philips 4C6, Neosid F16 or Indiana General Q1 materials. The Amidon FT240-61 ferrite toroid is 2.4 inches OD and has an AL value of 171 nanohenries. It would make a very effective high power balun covering the HF range with only 8 turns, much more manageable. This is born out by the design for an HF balun in the ARRL Antenna Book which uses a ferrite core.

If you are planning to use an iron powder toroid (T200-2) with significantly less than 33 turns it will not be very effective at the lower frequencies.

Keith Gooley VK5OQ
Lot 15
Tenafeate Crt
One Tree Hill SA 5114
ar

Spotlight on SWLing

Robin L. Hanwood VK7RH*

I recently obtained a copy of the 1997 edition of *Passport to World Band Radio* from the USA.

This is the first time I have looked at this annual handbook and I am rather impressed. Unlike the *World Radio TV Handbook*, this has been specifically targeted for short wave radio consumers, whether they are newcomers or the more experienced DXers. Newcomers will benefit from the easily understandable explanations on shortwave radio and how to find the various stations. The book is well thought out and is easy to use. As well, there are excellent receiver reviews edited by Larry Magne, who also has contributed to some receiver reviews in the WRTH. Magne happens to be the chief editor of the PWBR. Many of the current shortwave receivers, from the cheap portables to the expensive tabletop sets, have been reviewed. Also some add-on accessories have been tested and their effectiveness is discussed.

There is a section on English language broadcasts and programming information over the 24 hour period. You can look up a specific time slot and easily ascertain who is broadcasting what and where. As well, there

is another section devoted to individual broadcasters, complete with programming information and contact points to assist finding a specific broadcaster. In my opinion the presentation of this section in PWBR is superior to that in the WRTH because it gives background information on the particular station and if they reply, based on listeners' replies.

Reports to some broadcasters can be made difficult because the postal system inside a specific country can be erratic due to civil strife or light-fingered postal staff. This is the case within the Russian Federation, depending on the point of entry. Mail through St Petersburg is OK but air mail via Moscow Airport has been known to mysteriously disappear.

Some South American mail routes are also spotty whilst mail to Afghanistan is non-existent. PWBR also states that mail to North Korea is non-existent but thus apparently is the situation with US mail. Apparently mail is sent from the States to South Korea and naturally goes no further. From here I have had no problems with mail from Pyongyang!

One part of the broadcasting information concentrates on the so-called alternative political programming, which some regard as being extremely biased. It is aired over WWCR and other private American shortwave broadcasters. I don't know why all this information has been included in PWBR '97. Yet, I presume that, as the bulk of PWBR sales are in the USA, this information may assist listeners especially if these programs are not heard over mainstream American electronic outlets.

There is also a section on the new phenomenon of Web Radio. Strictly it is not radio as it is an Internet audio web site, where PC users can download programming from various radio broadcasters or program makers to play through the sound card. The sound quality is not as crystal clear as existing AM or FM outlets but it is growing, particularly as many entrepreneurs have realised that a net web radio site does not require any licensing and many diverse sources of programming can be found on the Internet. I do not know why this was included in PWBR other than because some international stations also have audio web sites.

However, I was very satisfied with the blue pages at the end of the book. This is a database of all shortwave broadcasting outlets from 2 to 21 MHz. It is very similar to the International Listening Guide that appeared in the mid 80's. Unfortunately, that

publication was rather erratic and the ILG stopped altogether, leaving many subscribers in the lurch. The PWBR blue pages have aided me to identify some exotic stations that I have recently heard.

For example, there is an Asian broadcaster on 4045 kHz around 1300z which PWBR has identified as Xizang (Tibet). I heard it whilst the exiled Tibetan spiritual leader, the Dalai Lama, was visiting Australia. Again PWBR '97 came up trumps identifying another station as Nepal on 7164 kHz at 1320 UTC. I have found these blue pages very useful despite the upheaval arising from the planned seasonal frequency alterations that took place on 27 October.

I obtained my copy from Grove Enterprises in Brasstown NC just under a fortnight from placing my order and it may be in Australian bookstores very soon.

On Monday morning, 28 October, I woke up in anticipation of hearing Radio St Helena in the South Atlantic. Turning the receiver on, I was dismayed to hear a strength four power line noise on 11 0925 MHz. As scheduled, a signal commenced at 1900 UTC (Sunday) yet it was well down beneath this local noise and frustratingly I could not pull out any information. Sadly, by 1910 the signal had already disappeared. Perhaps I will have better luck the next time around, that is if there is going to be another shortwave transmission from this remote Atlantic locale, where Napoleon ended his days.

I have just been informed that another broadcaster has abandoned shortwave. The Red Cross Broadcasting Service in Geneva apparently has decided to discontinue shortwave broadcasting after 50 plus years. A domestic South African shortwave station also ceased on 27 October and the new owners are restricted to FM. Transmissions from a Danish commercial station known as ABC Radio, which were being heard on 7570 kHz on Sundays, have also ceased. Apparently the station has new owners who were not interested in continuing hiring air time from the Russian transmitters at Kaliningrad.

The BBC Hong Kong relay is still there but as soon as the new Thailand relay is ready, the site will definitely be dismantled. Employees at Radio Canada International are again on the warpath as funding for the Canadian shortwave service does not go beyond 31 March. The employees and their supporters are attempting again to whip up support to keep RCI going beyond that date.

Well, another year has come to an end. Quite a deal has happened on shortwave over these twelve months and I am looking forward to hearing what 1997 will bring.

*S Helen Street, Newstead TAS 7250
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VHF/UHF – An Expanding World

Enc Jamieson VK5LP*

Australian Amateur Bands Beacons

Freq	Call sign	Location	Grid
50.047	VK8AS	Alice Springs	PG66
50.055	VK3SIX	Hamilton	QF02
50.057	VK7RAE	Devonport	QE38
50.057	VK8VF	Darwin	PH57
50.058	VK4RGG	Nerang	QG62
50.066	VK6RPH	Perth	OF88
50.075	VK4BRG	Sarina	QG48
50.306	VK6RBU	Bunbury	OF76
52.325	VK2RHH	Newcastle	QF57
52.345	VK4ABP	Longreach	QG26
52.370	VK7RST	Hobart (Heard in ZL 6/96)	
52.420	VK2RSY	Sydney	QF56
52.425	VK2RGG	Gunnedah	QF59
52.445	VK4RIK	Cairns	QH23
52.450	VK5VF	Mount Lofty	PP95
144.022	VK6RBS	Busselton	QF76
144.400	VK4RBB	Mount Mowbray	QG62
144.410	VK1RCC	Canberra	QF44
144.420	VK2RSY	Sydney	QF56
144.430	VK3RTG	Melbourne	QF20
144.435	VK3SIX	Hamilton	GF02
144.450	VK5VF	Mount Lofty	PP95
144.460	VK6RPH	Perth	OF88
144.465	VK6RTW	Albany	OF84
144.470	VK7RMC	Launceston	QE38
144.474	VK7RAE	Devonport	QE38
144.480	VK8VF	Darwin	PH57
144.485	VK3RAS	Alice Springs	PG66
144.530	VK3RGL	Mount Anaike	GF22
144.550	VK3RSE	Mount Gambier	QF02
144.560	VK6RBU	Bunbury	OF76
145.650	VK5RCW	Mount Lofty	PP95 (1)
432.066	VK6RBS	Busselton	QF76
432.160	VK6RPH	Perth	OF88
432.410	VK1RBC	Canberra	QF44
432.420	VK2RSY	Sydney	QF56
432.440	VK4RSD	Brisbane	QG62
432.450	VK5VF	Mount Lofty	PP95
432.450	VK3RAI	MacLeod	QF22
432.460	VK6RPH	Perth	OF88
432.474	VK7RAE	Devonport	QE38
432.539	VK3RMB	Mount Buninyong	QF12
1296.198	VK6RBS	Busselton	QF76
1296.410	VK1RBC	Canberra	QF44
1296.420	VK2RSY	Sydney	QF56
1296.440	VK4RSD	Brisbane	QG62
1296.450	VK5VF	Mount Lofty	PP95
1296.460	VK6RPH	Perth	OF88
1296.474	VK7RAE	Devonport	QE38
2306.440	VK4RSD	Brisbane	QG62
2403.450	VK5VF	Mount Lofty	PP95
3456.450	VK5VF	Mount Lofty	PP95 (2)
5760.750	VK5VF	Mount Lofty	PP95 (3)
10300.000	VK6RUF	Roleystone	OF78
10368.450	VK5VF	Mount Lofty	PP95 (4)
10368.460	VK6RPH	Perth	OF88

(1) This is a continuously operating CW training beacon using vertical polarisation.

(2) The 3456 MHz beacon was scheduled to commence on 1/11/96 with three watts to a horizontal omni-directional antenna.

(3) The 5760 MHz beacon was scheduled to commence on 1/12/96 with two watts to a horizontal omni-directional antenna. To have this beacon on the air this year it is sharing the same exciter as the 3 GHz unit, hence the frequency shall be 5760.750 MHz (5/3 x 3 GHz frequency). This is a temporary arrangement during the building process of a separate exciter for 5760.

(4) A direct lightning strike to the Channel 9 tower found its way into the power supply of the masthead unit. The good news is that it only took out the DC supply for the PA; the Qualcomm unit survived due to the shutdown protection for the negative rail working satisfactorily. The 7660 and supply line zeners took the blast. The 10 GHz beacon was scheduled to be re-installed in November at the time of the installation of the 3 GHz unit.

Thanks to David VK5KK for an update of the VK5 beacon situation.

Would other beacon custodians please advise me of any updates to the above list.

John VK3KWA reports news from the Cairns Amateur Radio and Electronics Club that the VK4RIK beacons at Mt Haren are now administered by the Club and not the Queensland Tropical DX Association. The only beacon currently operating is on 52.445 MHz. The others are still licensed but not on air. No information when they will be operating again.

New Records or Latest Update to 29/10/96

1. An inaugural VK4 state record for 2400 MHz: VK4OE4 NW of Stanthorpe to VK2FZJ4 at Maleny. 13/01/96, 224.8 km.

2. An inaugural VK5 state record for 24 GHz: VK5NC/5 at Mt Graham to VK5DK/5 at Beachport lighthouse, 6/10/96, 38.5 km.

3. 50 MHz Short path: VK4KK to GU7DHI 1502/92 16791.3 km; VK0EX to VK2QF 1401/95 4517.5 km 144 MHz: VK3AUU to VK6HK 1402/96 2816.8 km; VK6HK to VK3AUU 1402/96 2816.8 km. 1296 MHz: Mobile – VK3ALM/3 to VK3XXX/3 25/05/96 278.4 km. 2304 MHz: VK4OE4 to VK2FZJ4 13/01/96 224.8 km. 5650 MHz: VK3XPD/3 to VK5NC/3 11/08/96 145.8 km. 24 GHz: VK3XPD/3 to VK3ZQB/3 21/10/96 48.4 km*; VK5NC/3 to VK5DK/5 06/10/96 38.5 km.

* Spies report that the 24 GHz record has been extended to 57.5 km. More on this later.

Thanks to David VK5KK for sending the above to me via e-mail.

Notice of Event

Sunday, 29 December 1996 from 2 to 5 pm local, 0430 to 0730 UTC. Venue: Thebarton Seniors College, Thebarton SA. The VK5 Division of the WIA is presently using this venue for its monthly meetings.

Sam Jewell G4DDK is the guest speaker and he will provide a 45 to 60 minute illustrated lecture on the latest European microwave activity, to be followed by a question and answer period. Sam is also into microwave EME. All amateurs welcome, especially from interstate.

There will be displays, buy and sell stalls, equipment supply stand; also demonstrations by the locals on the lower GHz bands. You may phone David Minchin VK5KK on 08 8281 8172 or e-mail at tecknolt@ozemail.com.au for further information.

(Sam G4DDK added that microwave conditions were very good around 20-21/10 in the UK. He worked HB9AMH/p on 10 GHz at 684 km both nights. Tests on 24 GHz were unsuccessful, but he is sure the path will eventually be worked.

Sam adds: "My new 3.4 GHz system appears to be working well, even on the multiband horn (no dish). I estimate the gain at 14 dBi."

His Mates

John VK4FNQ in Townsville reports: "Conditions relatively quiet. On 20/10 at 0650 heard JA5CMO calling CQ on 50.110 and a 5x9 contact resulted, also 0658 JA1RUJ 5x7 with heavy QSB. JA1VOK heard calling CQ. At 0700 listened for beacons and other signals but nil heard. Only a brief opening but good to hear something."

Glenn VK4TZL reports the following on six metres from Hervey Bay: "12/7 VK3LK, VK4FNQ; 16/7 VK2ADQ, VK2BHO, VK3ZNF; 18/7 VK4KK; 1/8 VK4AFL. On 3/8 heard VK2BRL on 144.200 at 1955. 19/10 JE9MYA, JE9OYO, JR9PBV and JA00IK, all on 29 MHz FM; 21/10 JA1FQN (FM); 3/11 on 50.120 JA3JTG, JI2EVL, JA3EGE, JI3WGX"

Internet His Mates

From the On-Line Six Meter Magazine prepared by Geoff GJ4ICD.

21/10: Beacon news/change: Perhaps clients of your newsletter might be interested in knowing that I operate a beacon on 50.001 MHz (very stable TXO), consisting of a 25 W Tx feeding an 11 el Yagi pointing due east from Halifax, NS. The antenna has a clear view of the ocean. It is on 24 hours a day, the ID is VE1SMU H, repeating every

two or three seconds. Thus far I have received reports from EH1TA, EH7KW, W3IWU, WB8RUQ, KL7GLL, VE9AA, and VE1ZZ. 73s Bill Long VE1WPL.

8/10: Beacon news. John WZ8D plans to "plant" a new beacon in Grenada later this month. The beacon J3EOC has 1.6 watts out and is on 50 0565 MHz. The antenna will be a halo.

17/10: New Bandwidth in Italy It has just been reported that, effective this day, Italian amateurs have temporarily been granted the use of the whole 50 - 51 MHz band segment, on secondary basis. Said permission applies to both full licensees (I, IK, IZ) and VHF-only licensees (IW). Previously, Italians were confined in a 12.5 kHz segment (50151.25 - 50163.75). 73, de Tony 10JX.

20/10: JA to VK4: JA5CMO (PM63) worked VK4FNQ on 50.130 at 5x9 at 0653 for the first time this autumn. JA1VOK (QM05) worked VK4JH on 50.110 with 5x9 signals at 0654 by afternoon type TEP today. He said: "I heard 46.17/VK4 video and 46.24/VK2 video at 0600 for the first time this morning, with 46.24 video up to 59+ at 0630 before the opening."

22/10: High Power in OZ. The power limit in OZ has been raised to 1,000 W output to the antenna.

22/10: Good tropo and Es in Europe - continued all evening until 2030 GJ4ICD worked F6AUS/IN96 5x9+ via tropo and OZ5Wp 5x2/3 via tropo-scatter. Other areas involved were HB9 to LA, PA to YU, G to 4N, GW to EA, GB3LER to OE, CT to G, OZ to LA, HB9 to OZ, I to LA, OZ to I. Zaha OH1ZAA also reports OH1 to Italy-0-4-6, OH2-3-5 to Italy 2 area, also earlier there was aurora propagation to OZ. Later Es to SP and EH7/CT from southern G.

(It's quite surprising the degree of Es activity in the northern hemisphere so late in the season VK5LPJ)

24/10: 0106: N6XQ worked KH6IAA 50125.0 5x9 and heard three Mexican beacons.

50 MHz DX Challenge

During the recent European summer a contest was run to see who worked the longest distance via Es. Jose EH7KW and KB5IUA were the winners with a distance of 8057 km!

Geoff GJ4ICD on Jersey Island is offering a similar contest to the southern hemisphere summer period from 1 December to 31 January. All contacts must be below the equator (to exclude TEP), so will normally be in an east-west direction or derivatives therefrom, eg north east, south west, etc, but not south to north unless they are below the equator.

Claims could be sent to me by 14 February 1997 and I can forward them in

bulk to Geoff. Please supply appropriate grid squares to six places or your longitude and latitude.

Australian Record Attempt on 5.76 GHz

The West Australian VHF Group Bulletin for October reports that AJ VK6ZAY and Alan VK6ZWZ had a successful 5x9 contact on 5.76 GHz on 20/10 over the 237 km distance between Falcon (south of Mandurah) and Cervantes at 0830. This should qualify both for the Australian and West Australian record for that band.

DOS Programs for Homebrewing

Chuck KD9JQ has written four programs for ham homebrew projects, and has made them available via FTP from oak.oakland.edu/pub/simtelnet/msdos/hamradio/. The four are asp4.zip (RF weak-signal amplifier design), pll2v2.zip (design of second-order phase-locked loops), pll3v2.zip (design of third-order phase-locked loops), and tap2.zip (triode grounded-grid RF power amplifiers). Thanks to QST November 1996 *World Above 50 MHz*.

A Transatlantic Review

From Emil Pcock W3EP and *The World Above 50 MHz* in QST comes news that the spring and summer of 1996 was another extraordinary season for six metre transatlantic sporadic E. Although individual openings were often not as spectacular as those of 1995, the band was actually open for European contacts on more days! Indeed, the band opened earlier (May 20) and closed later (August 17) than in any previous year. Several days were counted when only a single beacon was heard or one contact was reported, but the statistics are still impressive.

Here is a summary of the 1995 and 1996 seasons by number of days on which European 50 MHz operators observed transatlantic sporadic E from the continental US or Canada:

Number of Days Open

Month	1995	1996
May	0	5
June	16	10
July	16	14
August	0	6
Total	32	35

Although the number of days was greater this past year, the total duration of openings was much longer in 1995. There was nothing in 1996 to match the 14 consecutive hours of European propagation on 7 July 1995, for example, or the number of European contacts made last year by stations west of the Mississippi River.

Europe - Africa Opening

Ted Collins G4UPS reports that six metres opened to southern Africa on 28/9. "I first heard the V51VHF beacon at 1645 UTC whilst we had an opening into EA7. No actual V51 activity heard, but TQ7RM was first heard in the UK in 1070 around 1728 and he is known to have worked several French stations and G3ZY, G6ION and G1K7Z all in Plymouth area. I heard him here at 1733 very weak 339, but no QSO and I did not hear anyone in this area working him.

"The last southern Africa opening on 6 m was in 1991. In 1993 on 24/9 there was an opening here to CN8ST, but the last opening from here to V51/Q etc in September was in 1991. So a rather pleasant surprise!"

Closure

VK activity has been very low during the month. If we follow the pattern of the northern hemisphere, then November should see a dramatic increase in Es contacts as they did during their May.

Please note there is now an e-mail address for receipt of information, vk5lp@ozemail.com.au in addition to fax, packet and ordinary mail. It would be great to have something really interesting to report in the next few months.

With this month I commence my 28th year of compiling these notes. Perhaps I should be considering a change at the helm?

David VK5KK has suggested that, from a tropo viewpoint for the higher bands, the usual summer openings may come earlier this time than that of February last year, perhaps around the end of January as has often been the case in the past. The openings will come as they always do, so be alert during January and February.

There is little doubt that we will see increased activity on 24, 3.5, 5.6, 10 and 24 GHz during the next twelve months, and I know there will be concerted efforts to increase the 10 GHz world record to more than 2000 km.

I wish all readers and the Editor and staff at *Amateur Radio* a happy Christmas and may the New Year bring its own blessings.

Closing with two thoughts for the month: 1. The nice thing about a gift of money at Christmas is that it's so easily exchanged, and

2. Not since the days of Red Indian scalp-gathering have so many people been going around with hair that isn't their own!

73 from The Voice by the Lake.

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Packet VK5LP@VK5WJ@ADL.AUS.OZ
E-mail vk5lp@ozemail.com.au

■

Silent Keys

Due to space demands obituaries should be no longer than 200 words.

The WIA regrets to announce the recent passing of:-

W F (Bill)	SIEVERS	VK3CB
J R (Jim)	MILWAY	VK3CX
J H (James)	MCNAMARA	VK3DME
L (Leslie)	MAROSVARY	VK4ANT
W B (Barrie)	BESTMANN	VK4LN
W M H (Bill)	WARDROP	VK5AWM

Jim Milway VK3CX

Jim died on 1 November, aged 68, after fighting cancer for 18 months. Born at Gawler SA, he joined the then Adelaide Electric Supply Company (later ETSA) as a junior trainee. Joining the WIA as an Associate Member in 1945, he was first licensed, as VK7ZAM, in 1954.

WIA News

US Microwave Band Caught Up In Spectrum Auction

A United States Congress move to put up 30 MHz of microwave spectrum for auction to raise funds to help balance the national budget, has caught up 5 MHz of the 2.3 GHz amateur allocation between 2305 and 2310 MHz.

An American Radio Relay League (ARRL) bulletin in mid-October outlined the congressional action to reallocate 2305-2320 MHz and 2345-2360 MHz to "wireless services that are consistent with international agreement concerning spectrum allocations." There are amateur allocations at 2300-2310 MHz, 2390-2400 MHz and 2402-2417 MHz. The latter two are allocated to US amateurs on a primary basis, won by ARRL action last year, whereas they have access to 2300-2310 MHz on a secondary basis.

The National Telecommunications and Information Administration (NTIA) had identified for re-allocation in 1994 the amateur segments 2300-2310 MHz and 2390-2400 MHz. ARRL Executive Vice President, David Sumner K1ZZ, said that congressional action directing the re-allocation of specific bands was very unusual, even unprecedented, but they had been anticipating something since 1994. He said that this now provided the opportunity to strengthen amateurs' claim to 2300-2305 MHz, which is not listed for auction. The ARRL subsequently announced it would seek a change in the Amateur Service status in this segment, from secondary to primary.

Meanwhile, the battle continues in the US over a satellite industry proposals for low earth orbiting ("Little LEO") communications satellites to share the 2 m and 70 cm amateur bands (see WIA News, page 5, July, and page 36, August).

The ARRL Letter Electronic Update for 1 November, said that, while the Little LEO proponents have not backed off, no technical documentation has been submitted to show how sharing with amateurs would actually work. However, the ARRL submitted in September a 42-page technical rationale detailing why sharing would be unworkable. There was no response from the Little LEO industry up to 1 November. Their deadline was 15 November. Under the procedures announced for WRC-97, where satellite spectrum requirements are to be considered, any US proposal must first be subjected to a notice from the Federal Communications Commission (FCC) and a public comment process, along with acceptance from the US Department of State and the NTIA. So there are a few hurdles, if anything further is to happen.

In addition, if other countries are working on sharing studies, these were expected to surface at a meeting of a working party of the ITU held over 29 October to 8 November in Geneva, Switzerland. The ARRL's Technical Relations Manager, Paul Rinaldo W4RI, attended the session as a member of the US delegation, while ARRL International Affairs Vice President, Larry Price W4RA, represented the International Amateur Radio Union. The output from this working party goes to the WRC-97 Conference Preparatory Meeting in May 1997, their report providing the technical basis for WRC-97 decisions. Without a technical basis in the record, ARRL Executive Vice President, David Sumner K1ZZ, said WRC-97 would be "hard-pressed" to agree to a shared allocation (with amateurs) but added, "The Little LEOs still might look for a way to get their camel's nose into our tent."

His life's work was electricity generation and distribution. He joined the Tasmanian Hydro Electric Commission in 1953 (Tarraleah Power Station), then the SECV (Latrobe Valley) from 1959 to 1961. In 1961 he became District Retention Officer at Mornington, ultimately retiring in 1986. From 1959 to 1974 he was active as VK3ZJM, becoming VK3CX in 1974.

Jim had many interests. He was in the Citizen Air Force (No 21 City of Melbourne Squadron) from 1966 to 1983, treasurer of the Mornington Soccer Club for 17 years, Mornington Sea Scouts (particularly in Jamboree on the Air), and an active member of WICEN. And sometime treasurer of St Peters Church, Mornington.

He belonged to three radio clubs (Southern Peninsula, Frankston and Mornington Peninsula, and Moorabbin and District), as well as the RAOTC, and recently took up packet radio.

I also mourn, with his wife Patricia and their four children (Susan, David, Michael and Peter). Jim and I were friends for 52 years and brothers-in-law since 1953

Bill Rice VK3ABP
ar

COM-AN-TENA

(formerly A. J. & J. Coman Antennae)

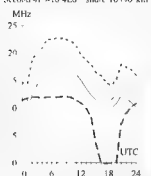
6M std 6 ele 40 mm boom	\$216
2M colinear 2 5/8 7dbd	\$ 97
12 ele 2M broad B/widh	\$135
6M 4 ele delta loop	\$221
6M 5/8 vertical - radial	\$157
6 ele 6 M.N.B.S. 50 mm Boom	\$310
Duo 10-15 M	\$305
3 ele 15 M	\$214
3 ele 20 M	\$351
20 m log-yag array 11.5 dbd	\$765
M B Vert NO TRAPS 10-80 M	\$275
Tn band beam HB 35 C 5 ele	\$690
40 M linear loaded 2 ele	\$536
13-30 M logperiodic 9 ele	
all stainless/steel 1 tings	\$891
70 cm beam 33 ele 19 9 Dbi	\$228
23 cm slot fed 36 ele brass cons	
s/solder-assembled, 18 dbd	\$170
80 m top load/cap/hat vert.	\$260
Tn band 6 ele 6M boom	\$860
2 m 144.100 2 2 wavelength boom	\$145

When no answer on factory phone
call on mobile 0419 542 437

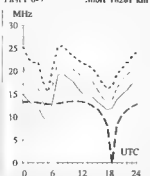
Call ANDY COMAN VK3WH,
LOT 6 WEBSTERS ROAD,
CLARKFIELD 3429
PHONE 054 285 134

Adelaide-Harare 245

Second 41°-04E0 Short 10790 km

**Brisbane-Dakar** 217

First F 0-5 Short 18281 km

**HF Predictions**

Evan Jarman VK3ANI

T Index: 12

Frequency scale

UD

MUF

OMF

E-MUF

ALF

Time scale

These graphs show the predicted diurnal variation in key frequencies for the nominated circuits. They also indicate a possibility of communication (percentage).

The frequencies identified in the legend are:-

Upper Decile (10%)

Maximum Usable Frequency (50%)

E layer MUF

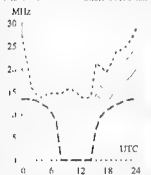
Optimum Working Frequency (90%)

Absorption Limiting Frequency

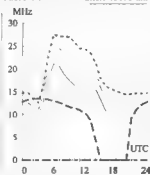
The predictions were made by one of the Ionospheric Prediction Service Stand Alone Prediction Systems. The T index used is shown above the legend. The Australian terminal azimuth (degrees), path length (kilometres) and propagation modes are also given for each circuit.

Adelaide-Los Angeles 66

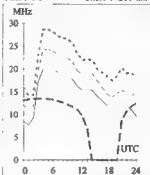
First F 0-5 Short 13158 km

**Brisbane-Athens** 297

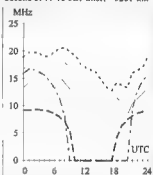
First F 0-5 Short 15190 km

**Canberra-Cairo** 283

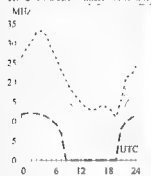
First F 0-5 Short 14266 km

**Darwin-Christchurch** 139

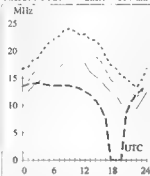
Second 3F11-16 3E1 Short 5281 km

**Adelaide-Osaka** 357

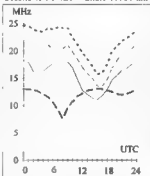
Second 31-4-8 3E0 Short 7747 km

**Brisbane-Marion Island** 218

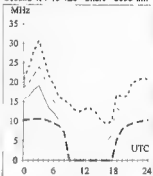
First 3F1-6 3E0 Short 9554 km

**Canberra-Montevidéo** 159

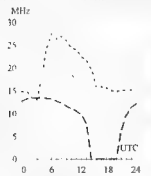
Second 4F4-5 4E0 Short 11784 km

**Darwin-Honolulu** 65

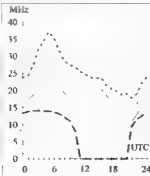
Second 4F7-13 4E0 Short 8636 km

**Adelaide-Rome** 296

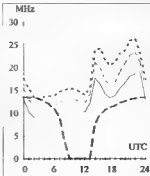
First F 0-5 Short 15336 km

**Brisbane-Singapore** 293

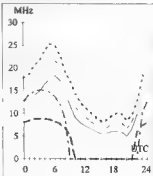
First 2F2-6 2E0 Short 6146 km

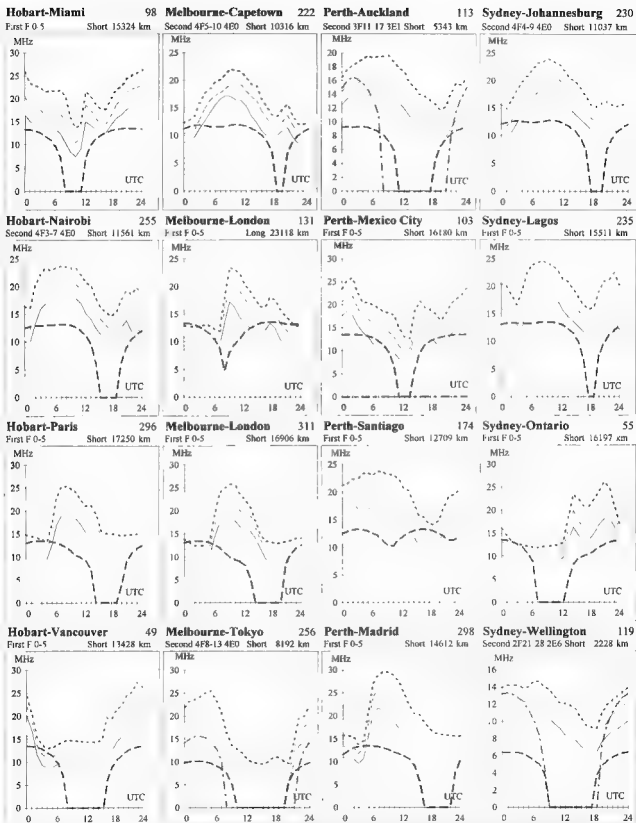
**Canberra-Washington** 70

First F 0-5 Short 15938 km

**Darwin-Nagasaki** 359

Second 3F12-18 3E2 Short 5056 km





HAMADS

TRADE ADS

* AMIDON FERROMAGNETIC CORES:

For all RF applications. Send business size SASE for data/price to RJ & US Imports, PO Box 431, Kiama NSW 2533 (no enquiries at office please). 14 Boanyo Ave Kiama). Agencies at Geoff Wood Electronics, Sydney Webb Electronics, Albury. Assoc TV Service, Hobart Truscott's Electronic World, Melbourne and Mildura, Alpha Tango Products, Perth Haven Electronics, Nowra and WIA Equipment Supplies, Adelaide

* **WEATHER FAX programs for IBM XT/ATs** *** "RADFAX2" \$35.00, is a high resolution shortwave weatherfax, Morse and RTTY receiving program. Suitable for CGA, EGA, VGA and Hercules cards (state which). Needs SSB HF radio and RADFAX decoder *** "SATFAX" \$45.00, is a NOAA, Meteor and GMS weather satellite picture receiving program. Needs EGA or VGA & WEATHER FAX PC card, +137 MHz Receiver *** "MAXISAT" \$75.00 is similar to SATFAX but needs 2 MB of expanded memory (EMS 3.6 & 4.0) and 1024 x 768 SVGA card. All programs are on 5.25" or 3.5" disks (state which) plus documentation, add \$3.00 postage. ONLY from M Delahunty, 42 Villiers St, New Farm QLD 4005 Ph (07) 358 2785

* **HAM LOG v3.1** - Acclaimed internationally as the best IBM logging program. Review samples "AR: 'Recommend it to anyone', The Canadian Amateur 'Beyond this reviewer's ability to do it justice. I cannot find anything to improve on. A breakthrough of computer technology'. ARA 'Brilliant'. Simple to use with full help, the professional HAM LOG is immensely popular (now in its 5th year), with many useful, superb features. Just \$59 (+\$5 P & P), with a 90 page manual. Special 5 hour Internet offer! Demos, brochures available. Robin Gandevia VK2VNZ (02) 369 2008 BH fax (02) 369 3069

Internet address rhg@ozemail.net.au.

FOR SALE NOW

Deceased Estate Tektronix oscilloscope model 422 15 MHz dual channel, \$350. **TH6 Yagi** mounted 30 ft approx wind-up tower, \$900. Purchaser to remove G Chapman VK2AJT (02) 9876 4785

Power supply 13.8 volt 25 amp, fully metered, with over-voltage and over-current protection, home brew, patterned on EA Powermaster, transformer secondary rated at 75 amps, buyer to collect, \$125. Ken VK2ATK QTHR (02) 9809 4000

Yaesu FV901DM external VFO, excellent condition in original box with leads and manual. \$300 ono. **Yaesu FT901DM** HF xcvr, good condition, manual, YD148 base mic plus all leads, \$600 ono. **Icom IC-2GAT** handheld with BP-70 battery, boxed and in mint condition, includes wall charger ant, manual and cets, also BC-36 desk top charger, AD-12 external pwr adaptor, HM-46 speaker mic, HS-51 headset, MFJ dual bander ant (1/2 wave) plus LC-40 carrycase, cost \$1140, sell for \$800 ono, all items runt condition, can separate if required, MFJ Tx Ant switch model MFJ-1700B, mint cond, \$125, Motorola handheld leather carrycase, heavy duty, gd cond, \$25, Leson Pwr mike

model TW-285B boxed, mint cond, \$35; BC-275 27 MHz freq counter by NACL, gd cond, \$35, Icom LC-40 carrycase for handheld, gd cond, \$20. Steve VK2SPS QTHR

AEA PK232 with Pactor and all manuals, spare EPROMS, \$500, **Epson MX-80** printer in good condition with spares, \$60; **Epson MX100**, \$60. **Icom IC24AT VHF/UHF** hand held with service manual, speaker mike and other bits, \$490; **Yaesu FT747GX** with FM board and mobile mount, service manual, \$850. **Horst VK2JHL QTHR** (02) 9971 9795

70 cm Power amplifier RFCMA444, near new, bought Daycom for special job, excellent performer, handheld in, 15 watts output, \$190. **Sid VK2SW QTHR** (069) 22 6082

Kenwood TS870 DSP, new in carton full documents, \$3,000. **Peter VK2FFA** (043) 24 4160
Hy-gain TH3 MK3, Thunderbird 3 element antenna, perfect condition, elements separated from boom, ready to pick-up, manual included, \$240 ono. **Bruno VK2BPO QTHR** (02) 9713 1831

Collins S line 75S3B (500 Hz filter) Rx, 32S1 Tx, 312B-A station control (wattmeter, speaker, phone patch), 516F-2 power supply (2nd speaker), Astatic 10DA desk microphone (enhanced for SSB), manuals, cables, spare tubes, \$1,250. All in A1 condition. **Arthur VK2AS QTHR** (02) 9416 7784

Kenwood AT-180 antenna tuner (200 W) s/n 20260, \$175. **Kenwood TH2S-A** 2 m handheld, s/n 9073547, with case, charger, manual and box, \$225. **Tom MR-1300E** 2 m amp (120 W) with Rx preamp, s/n 75488, \$475; 6 m Yagi, \$200. **Steve VK2KFJ** (02) 9975 3933 AH

Hewlett Packard sig gen model 406A 50 kHz - 65 MHz, also digital multimeter model 3476B, pulse generator model 214A, also HP612A, HP618C, HP410C and AV073 VOM. **Peter VK2CPK** (06) 231 1790 or (017) 98 3990

Deceased Estate VK2AHW **Yaesu FT767GX**, s/n BL200531, 100 W HF 6 m, 2 m and 70 cm, \$1,200; **Yaesu FT470** 2 m, 70 cm handheld, \$300. **Tokyo hi-power** 70 cm linear HL45UC, \$150. **Dick Smith** 2 m linear K6313, \$100. **Dick Smith** lab scope Q1280, \$150. All enquires Kevin VK2BKG QTHR (049) 82 2250

Yaesu FT990 etc, s/n IL090231, all optional filters, ATU, desk mike MD1CB, original packing, \$2,350. **Ian VK2UG** (043) 92 1234, NOT QTHR

Deceased Estate VK2JIN **Alinco** 2 m transceiver, s/n 31073416, ALX-2T, \$350. **Hustler** multiband antenna, \$300; **Mobil** 1 40 m antenna, \$30. **John VK2ZET** (02) 9449 3115 after 7pm

FOR SALE VIC

Satellite receiver dual input low noise, 100 channel remote control with on-screen display, "K" band LNC also supplied, \$250. **Neil VK3BCU** (03) 9390 2873

Free Fluke digital multimeter 8000A; **Racal** universal connector 9837, both without handbooks and need some attention, 3 x 3.5" floppy disk drives ex Microbee computer, suspect 720 kb but not tried. **Allen VK3SM** (03) 9386 4406.

4 El homebrew Yagi, 20 m mono, 8 m boom, 1.5

kW balun, coax, clamps, built to specs, ARA ant book No. 3, page 68, model N2FB ant, dismantled, \$200. **Willem** (03) 9758 5701

Yaesu FT101E HF transceiver includes CW filter, \$400; **Yaesu FT707** HF transceiver with 160 m, \$600. **Ken VK1DQW** (052) 51 2557 AH

Shack Cleanout Icom IC575H xcvr 6 m/10 m (front panel slightly damaged, but works perfectly) \$1,300, **Icom IC25H** 2 m 45 W FM xcvr, \$300, **Philips FM321** 70 cm xcvr, \$125, **Yaesu FT101**, has been modded, \$200; **Yaesu FT290R** together with Muck SLNA 1454b low noise front end (not fitted), \$450, **Yaesu FT10160** 10 watt amp for FT690R, \$50, **AOR 2 metre FM handheld**, \$200, **Icom BC30** desk charger, \$100, **Icom IC282**, \$150. **Mike Good** VK3BDL (03) 9589 5797, licensed amateurs only

Nally tower 14 m, \$650; **TS430S** (FM board), \$950; **FT7**, \$380, **RT80** VHF hi band, \$50, **Marconi** mod meter **TF** \$300, \$650, **Arlie** line conditioner 500 VA 240 V, \$550, **Isolation TImr** 240 V 100 VA, \$12, **PM900** Selcal module, \$45, **Amiga** 500 mouse, joystick, games, packet s/w, mono monitor, \$130; **Amstrad 2286/40** 12 MHz, 40 m H/D, keybd, mouse, 3.5 floppy, no monitor, \$120, **CGA monitor**, \$50. **Lee Moyle VK1GK QTHR** (03) 9544 7368

Yaesu FT707 xcvr w/pwr supply and antenna tuner, \$700, **FL2010** 2 m linear, \$15, **Realistic AX190** hamband R w/spkr, \$75, **Lunar** freestanding 17 ft tower, \$200, **Hy-gain TH3JR** beam, \$125, **Chirside CE38** 5 el 3 band beam, \$300, **Emulator** rotor, \$175, **CB ant**, \$50, **Nally tower** 42 ft, \$400. **Laurie VK1VDP** (03) 9818 6009

Icom IC2A VHF with HM46 spkr mic and BC-36 charger, also two spare battery packs, s/n 2925, \$240 post paid, **Pwr xfmtr A & R type FT1371**, 2000 VCI, 300 mA DC, has tapped sec, \$80. **Peter VK3IZ** (051) 56 2053. **Meitang**

Icom IC725 HF all-band transceiver very good condition, \$1,100 ono, **Kenwood TS50S** HF transceiver as new, \$1,150 ono. **Bill VK3WK QTHR** (055) 61 1376

Kenwood TS820S HF txv, 740961, digital freq display, excellent condition, recently checked **Kenwood**, Sydney, original carton, manual, mike, extra speaker in matching cabinet, **DSIA** DC converter, mobile operation, unused in carton, \$650. **Gordon VK3ABI QTHR** (052) 89 1812

SW Receiver Philips 15 bands, digital, model AE362500, instruction manual, s-wave handbook, s/n KT039419050620, new, \$140, **Yaesu** monitorscope YO-100, as nc, s/n 6H211190, manual, \$240, **Moonbeam** Yagi, 10 m or CB, new, **Werner Wulf**, \$80. **Harry VK3AXJ QTHR** (03) 9802 5704

Yaesu FT707 transceiver, 100 watts output, including WARC bands, in good condition with scanning mike and manual, **FY707DM** digital VFO, 12 memory, very stable, the lot \$550. **Ray VK3FQ QTHR** (054) 36 8301

FOR SALE CWA

Packet, AMTOR, RTTY, CW HF/VHF/UHF PK64 modem, 2 C64 Commodore computers, 1541-11 disc drive, MPS803 printer, monitor, joystick,

software Geos, satellite, grayline, log book, flight simulator, all manuals, \$350. VK4AI QTHR (07) 3284 5688.

4 Stage tilt-over antenna tower, fittings, 75ft, \$500; Earth braid one inch, 7 m to 27 m lengths, \$2 metre; 3000+ valves, metal octal miniature catalogue. 12UX/50 Rola speaker. Peter Hadgraft, 17 Paxton St. Holland Park Qld 4121, (07) 3397 3751 AH.

Pocom AFR-1000 fully automatic RTTY-Decoder with video outlet, as new, \$400; 4-Band Spider antenna, mobile or limited space (as advertised in QST) w/mount, \$120. Hans L40370 (ex HSIALK) (07) 5479 4561.

Deceased Estate VKAANT. Yaesu FT57GX HF txcvr, pc, \$1,000 ono; Yaesu FL2100Z, as new, \$900 ono; Yaesu FT270R mobile, pc, \$250 ono; Yaesu pre amp FRA7700, pc, \$50; Yaesu power supply FP757GX, pc, \$280 ono; Daiwa auto tuner 80-10 m model CNA 1001, pc, \$350 ono; Daiwa antenna tuner model CL680, pc, \$110 ono; Daiwa mic compressor MC220, new, \$100 ono; Daiwa antenna rotator DC7011, pc, \$300 ono; Daiwa cross-needle SWR meter CN410M, pc, \$90 ono; Daiwa cross-needle model 4301, 2 and 70 SWR meter and tuner, pc, \$150 ono; Icom IC751 txcvr, HF, with voice synthesiser, pc, \$1,000 ono; Heathkit dual trace oscilloscope, pc, \$80 ono; Tono 7000, pc, \$90; Drake TR7 txcvr with power supply and external VFO, pc, \$750 ono; Drake low-pass filter, pc, \$40 ono; Antenna TET Emtron HB35C, full size tri-bander, pc, \$350 ono. Mick VK4NE QTHR (07) 3219 8330 AH.

FOR SALE SA

Cubical Quad dual band 10/15 m, "Bandit" spreader bases, only single coax feeder required, \$150 ono. Rob VK5CS (085) 68 5411.

Kenwood TS530S HF xcvr, s/n 2040307; Kenwood MC50 desk mic; matching Kenwood speaker SP230; spare PA valves, \$650 ono the lot. John VK5FOX (08) 8326 0913.

FOR SALE WA

GAP antenna Titan DX, new, \$400; Commodore C64 with DD, \$100; Amiga 500 with 2 x DD, \$200; Targa beam 3 el 10-15-20 m, \$200; Terlin 10-15-20 100 W version, \$100. Walter VK6BCP QTHR (09) 341 2054.

WANTED ACT

Marconi video oscillator TF885A/1 circuit diagram. All costs met. Dave VK1DT QTHR (06) 295 1874.

New finals for FT101ZD Yaesu, specially driver 12BY7A tube as I cannot transmit on 5SB, also YD50 dummy load, will pay any reasonable price. Fred VK1FH QTHR (06) 285 2059.

WANTED NSW

Rotator, medium heavy duty such as Kenpro KR1000, Create RCSA-2, Emotator 1200FCX. Guy VK2BBF QTHR (047) 51 6726 AH or (02) 850 8930 BH.

Kenwood TR-7730 2 m FM txcvr, must be in good working condition with manuals, etc, reasonable price paid. Dan VK2DC QTHR (047) 39 2782 AH.

Bird 4311, 4410 wattmeters, Levell TM6B broadband voltmeter - copies of manuals circuits, any technical info, please. Bob VK2CAN QTHR (02) 9416 3727.

Australian Morse Keys, especially Buzza range, Automorse, McDonald Pentagraph. PMG and any unusual keys. Pay top dollar for any of the above, must be in good condition. Steve VK2SPS (02) 9999 2933 after 6pm.

WANTED VIC

Amplifier R8 MK2 No 2 to work with Wireless set No 19, has 4 x 807 valves and large generator, also headset and mic for A510 radio, alignment information for Wireless set no 19 MK3 (English). Clem VK3CYD QTHR (051) 27 4248 AH.

WANTED QLD

Require circuit diagram for signal tracer University Graham model 378 AST, Harold VK4VKA QTHR (07) 3265 3778.

Tentec Century 21 CW txcvr and Icom IC72b txcvr, will also appreciate quantities of copper wire (up to 3000 m) suitable for large HF array. Details to "Doc" VK4CMY, PO Box 24, Dalveen Qld 4374, (076) 85 2167.

WANTED WA

Lend of Old Callbooks prior to 1950 and after 1928. To establish first use of VK6 call signs. Books will be carefully used and returned. All packing/postage costs will be reimbursed. Neil VK6NE QTHR (09) 409 9333.

From February 1980 issue of Ham Radio magazine a clear copy of the article "New class of coaxial line transformers" (part one). Bob VK6ABS QTHR (090) 75 4136.

WANTED TAS

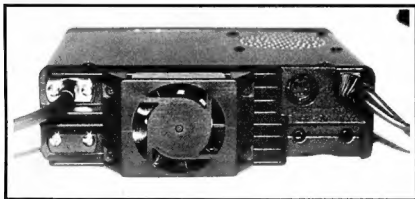
Icom TYR 7000 FM and TV unit for Icom R7000 rcvr scanner. Martin L70067 (03) 63 318705.

MISCELLANEOUS

* THE WIA QSL Collection (now Federal) requires QSLs. All types welcome especially rare DX, pictorial cards and special issue. Please contact the Hon Curator, Ken Matchett VK3TL, 4 Sunrise Hill Road, Montrose VIC 3765, Tel (03) 9728 5350.

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Update



Rear panel view of the Yaesu FT-8500 reviewed on pages 9 - 11 of the November 1996 issue of *Amateur Radio* magazine.

Yaesu FT-8500 Review

Oops! The wrong photo and caption sneaked into the review in last month's *Amateur Radio*. The photo at the top of page 11 is actually of the rear panel of the Yaesu FT-3000, reviewed in this month's *Amateur*

Radio. The correct photo of the rear panel of the FT-8500 is reproduced here.

It just goes to show that, no matter how careful we are in proofing our magazine each month, sometimes an error sneaks through all our checks.

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WIA MORSE PRACTICE TRANSMISSIONS

- VK2BWI Nightly at 2000 local on 3550 kHz
- VK2RCW Continuous on 3699 kHz and 144.950 MHz 5 wpm, 8 wpm, 12 wpm
- VK3COD Nightly (weekdays) at 1030 UTC on 28.340 MHz and 147.425 MHz
- VK3RCW Continuous on 145.650 MHz, 5 wpm, 10 wpm
- VK4WIT Monday at 0930 UTC on 3535 kHz
- VK4WCH Wednesday at 1000 UTC on 3535 kHz
- VK4AV Thursday at 0930 UTC on 3535 kHz
- VK4WIS Sunday at 0930 UTC on 3535 kHz
- VK5AWI Nightly at 2030 local on 3550 kHz
- VK5RCW Continuous on 144.975 MHz, 5 wpm to 12 wpm
- VK6RCW Continuous on 147.375 MHz, 3 wpm to 12 wpm

WIA Divisions

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division Address	Officers	Weekly News Broadcasts	1997 Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601	President Philip Rayner Secretary John Woolner Treasurer Bernie Kobler	VK1PJ VK1ZAO VK1KP 3,570 MHz LSB, 146,950 MHz FM each Sunday evening commencing at 8.00 pm local time. The broadcast text is available on packet, on Internet ausradio.amateur.misc newsgroup, and on the VK1 Home Page http://mail.nrl.gov.au/~omakh/wiaact.html	(F) \$72.00 (G) (\$5) \$58.40 (X) \$44.00
VK2 NSW Division 109 Wigram St Parramatta NSW (PO Box 1068 Parramatta 2124 Phone (02) 9699 2417 FreeCall 1800 817 644 Fax (02) 9633 1525	President Michael Corbin Secretary Eric Fossey Treasurer Eric Van De Weyer (Office hours Mon-Fri 11.00-14.00 Sat 1000-1300 Mon 1900-2100)	VK2YC VK2EFY VK2KUR From VK2WI 1,845, 3,595, 7,146*, 10,125, 24,950, 28,320, 29,120, 52,120, 52,525, 144,150, 147,000, 438,525, 1281,750 (* morning only) with relays to some of 14,160, 18,120, 21,170, 584,750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet ausradio.amateur.misc , and on packet radio.	(F) \$66.75 (G) (\$5) \$53.40 (X) \$38.75
VK3 Victorian Division 40G Victory Boulevard Ashburton Vic 3147 Phone (03) 9685 9261 Fax (03) 9685 9296	President Jim Union Secretary Barry Wilton Treasurer Rob Hailey (Office hours Tue & Thur 0830-1530)	VK3PC VK3XV VK3NC VK3BWI broadcasts on the 1st Sunday of the month, starts 10.30 am. Primary frequencies 1.840 AM, 3.615 LSB, 7.085 LSB, and FM(R)s 146.700 Mt Dandenong, 147.250 Mt Macedon, 147.225 Mt Ben Bulbin, and 2 m FM(R)s VK3RMA, VK3RSH and VK3ROW. 70 cm FM(R)s VK3ROU and VK3RGL. Major news under call VK3WI on Victorian packet BBS. 1,825 MHz SSB, 3,605 MHz SSB, 7,118 MHz SSB, 14,342 MHz SSB, 28,400 MHz SSB, 29,220 MHz FM, 52,525 MHz FM, 146,700 MHz FM, 147,000 MHz FM, 438,525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3,605 MHz SSB & 147,000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) \$75.00 (G) (\$5) \$61.00 (X) \$47.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone (074) 96 4714	President Geoff Sanders Secretary John Stevens Treasurer John Presotto e-mail address: wiaq@tmbris.mhs.oz.au	VK4KEL VK4AFS VK4WX 1,825 MHz SSB, 3,605 MHz SSB, 7,118 MHz SSB, 14,342 MHz SSB, 28,400 MHz SSB, 29,220 MHz FM, 52,525 MHz FM, 146,700 MHz FM, 147,000 MHz FM, 438,525 MHz (Brisbane only), regional VHF/UHF repeaters at 0900 hrs Sunday. Repeated on 3,605 MHz SSB & 147,000 MHz FM, regional VHF/UHF repeaters at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ@VKNET.	(F) \$75.00 (G) (\$5) \$61.00 (X) \$47.00
VK5 South Australian Division 34 West Thebarton Rd Thebarton SA 5031 (GPO Box 1234 Adelaide SA 5001) Phone (08) 8352 3428 Fax (08) 8264 0463	President Peter Watts Secretary Maurie Hooper Treasurer Charles McEachern Web: http://www.vk5wia.ampr.org/	VK5ZFW VK5EA VK5DKK 1,827 MHz AM, 3,550 MHz LSB, 7,095 AM, 14,175 USB, 28,470 USB, 53,100 FM, 147,000 FM Adelaide, 146,700 FM Mid North, 146,800 FM Mildura, 146,825 FM Barossa Valley, 146,900 FM South East, 146,925 FM Central North, 147,825 FM Gawler, 438,425 FM Barossa Valley, 438,475 FM Adelaide North, ATV Ch 35 579,250 Adelaide, (NT) 3,555 USB, 7,085 USB, 10,125 USB, 146,700 FM, 0900 hrs Sunday, 3,585 MHz and 146,675 MHz FM Adelaide, 1900 hrs Monday.	(F) \$75.00 (G) (\$5) \$61.00 (X) \$47.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone (09) 351 8673	President Cliff Bastin Secretary Christine Bastin Treasurer Bruce Hedland-Thomas	VK6LZ VK6LZ VK6OO 146,700 FM(R) Perth, at 0930 hrs Sunday, relayed on 1,825, 3,560, 7,075, 14,116, 14,175, 21,185, 29,680 FM, 50,150 and 438,525 MHz. Country relays 3,582, 147,350(R) Bussellton and 146,900(R) Mt William (Bunbury). Broadcast repeated on 146,700 at 1900 hrs Sunday, relayed on 1,865, 3,583 and 438,525 MHz; country relays on 146,350 and 146,900 MHz.	(F) \$66.75 (G) (\$5) \$48.80 (X) \$32.75
VK7 Tasmanian Division 5 Helen Street Newstead TAS 7250 Phone (03) 634 42324	President Andrew Dixon Secretary Robin Harwood Treasurer Terry Ives	VK7GL VK7RH VK7ZTI 146,700 MHz FM (VK7PHT) at 0930 hrs Sunday relayed on 147,000 (VK7RAA), 146,725 (VK7RNE), 146,825 (VK7RMD), 3,570, 7,060, 14,130, 52,100, 144,150 (Hobart) Repeated	(F) \$74.00 (G) (\$5) \$60.00 (X) \$46.00
VK8 (Northern Territory is part of the VK5 Division and relays broadcasts from VK5 as shown received on 14 or 28 MHz).		Membership Grades Full (F) Pension (G) Needy (G) Student (S) Non receipt of AR (X)	Three-year membership available to (F) (G) (X) grades at fee x 3 times

Note: All times are local. All frequencies MHz.

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